The Canadian
Medical Association Journal

Vol. XIII TORONTO, SEPTEMBER, 1923 No. 9

INJURIES TO THE FOREARM AND HAND*

J. A. Gunn, M.D., F.A.C.S.

Surgeon, Winnipeg General Hospital

WHEN I was asked by the secretary to open the discussion on injuries to the forearm and hand, I took it for granted that this particular subject had been selected because of its importance from an industrial point of view and because of its interest to a very large group of medical men, including not only surgical specialists but also, and perhaps most important, the general practitioner. With this in view I have tried to confine my remarks to the more common injuries and lay no claim to any particularly original views. I have merely tried to gather from various sources, including my own personal experiences, some practical hints on the treatment of this very important class of injuries.

In order to amplify my statement in regard to the importance of forearm and hand injuries from an industrial standpoint, I asked for and was granted permission to make a summary of the cases that have come under the Workmen's Compensation Board of Manitoba. A brief review was made of the accidents which occurred during the past two years, numbering in all 16,428. Of these, 2,354 or 14.3 per cent were injuries to the forearm and hand, and the average duration of the disability, reckoned from the standpoint of compensation paid, was twenty days. Some permanent disability followed in 7.73 per cent. Laceration and crushing injury of fingers formed the largest group, 801 cases, with average length of disability of thirteen days. The fracture cases numbered 185 with average disability of forty-six days, phalangeal fractures requiring twenty-six days, and fractures of radius and ulna together, seventy-three days. Strange to say, only one case of carpal fracture is noted in this series. This may possibly be explained by what will be said later in dealing with fracture of scaphoid. Some of the carpal fractures may be included in the group of eighty-two sprains of wrist. The thirty-nine cases of finger tendons severed had an average disability of fifty-five days, and twenty-three cases or sixty per cent. were discharged with some permanent disability. The importance of this class of injury will be referred to later.

The statement has been made recently[1] that the greater disability caused by comparatively minor lesions of the upper limb, as compared with similar lesions of the lower limb, is explicable by the finer adjustment of the neuro-muscular mechanism and more sensitive connection between the brain and periphery found in the former. Whether this be true or not, it serves to emphasize the fact of the relative importance of so-called minor injuries of the upper limb.

Although the question of infection does not come within the scope of this discussion, yet it must be borne in mind that the presence of septic foci in other parts of the body may interfere to a very marked degree with the successful treatment of injuries, and should be cleared up at the earliest moment.

I do not propose to classify injuries into major and minor groups, for the simple reason that some of the so-called minor injuries require much more careful and skilful treatment than many of those which are designated by the more pretentious term.

*Read at the Canadian Medical Association Meeting, Montreal, June 12th, 1923.

Fractures

In considering the treatment of fractures, there are several points which one should always have in mind. In the first place a reasonably accurate knowledge of the anatomy of the part is essential, particularly the muscular attachments which may have a part in producing deformity, or reproducing deformity after reduction. In the second place, it must be borne in mind that in the care of a fracture the treatment is not limited to the site of fracture, but to a greater or less extent involves the whole limb, and the length of time of immobilization, when and how to begin movements, and when to discard fixation apparatus are all of prime consideration.

It will, I think, be taken for granted that a good functional result is of more importance than a good anatomical result, but in the vast majority of cases the former is only obtained in conjunction with the latter. The brilliant exceptions in no way nullify the general principle. It may, however, be modified to a certain extent by stating that good functional results in children depend less upon good anatomical results than in older patients, or in other words the older the patient, the more important it is to secure anatomical reposition of the fragments.

Another consideration which it seems hardly necessary to mention, is that fractures in the vicinity of, or involving a joint, may result in ankylosis of that joint. Hence it should be an invariable rule to immobilize the joint in that position in which, if ankylosis should occur, the limb will be the most useful.

It has been stated[2] that fractures of both bones of the forearm are the most poorly treated of all fractures in the body. This is probably due to the difficulty in getting accurate apposition of the fragments and in retaining them in good position. This is of greater importance than in fracture of other bones. The fractured ends must be brought into good apposition. Even when a good position of the fragments is obtained, the end results may be disappointing because of excessive callus formation or non-union.

When the fracture of the radius is situated below the level of the insertion of the pronator radii teres it is customary to place the forearm in the mid-prone position, i.e., with the palm facing towards the chest. Not only is this attitude the most favourable for insuring correct apposition of the fragments, but it has the advantage also of being the position of greatest ease for the limb. When the radius fracture, however, is above the insertion of the pronator radii teres, it is all-important to prevent union taking place with rotary displacement, and with this object in view it is necessary to maintain the forearm flexed and fully supinated during the healing process, so that the lower fragment may be brought into proper line with the upper.

In fracture of both bones, accompanied by marked displacement which cannot be satisfactorily rectified by manipulation, conservative treatment is as a rule unsatisfactory. In such cases it would certainly be better to expose the fractured ends and apply some form of mechanical fixation than incur the risk of faulty union and greatly impaired function. There does not seem to be any valid reason for delaying operation, presumably to get the tissues in better condition. The earlier the open operation is done, the easier it is and the more satisfactory the result. Hence, it should be carried out as soon as it can be determined that non-operative measures are not likely to succeed.

Fracture of the shaft of the ulna is not infrequently accompanied by dislocation of the head of the radius, which may be overlooked unless one is on the look-out for it. In this case the arm of course should be put up in acute flexion after reduction.

It may seem almost unnecessary to refer more than by way of mentioning it, to Colles' fracture, but Colles' statement that this is by far the most common injury to which the wrist or carpal extremities of the radius and ulna are exposed is probably still true to-day, and judging from the prominence it occupies in present day surgical literature, one cannot fail to draw the conclusion that the results of treatment are not by any means uniformly satisfactory. It is certainly true that the usual text-book method of reduction, which is practically that described by Colles in his original article published in 1814, viz., by taking a grip of the hand as if shaking hands, is in many cases quite insufficient. The method described by Sir Robert Jones is probably the simplest, easiest and most effectual. He grasps the patient's arm in his left hand, if the left is the injured arm, with his own scaphoid tubercle against the projecting lower end of the shaft. His right hand he places on the dorsum of the patient's wrist with his own scaphoid on the projecting lower fragment. A firm grip with a slight traction and twist of the wrist, completely

XUM

reduces the deformity. As he says, it requires knack rather than strength.

I have never forgotten the method described by the late Dr. Murphy. Grasp the forearm and wrist firmly with both hands, placing the thumbs on radial border, at site of fracture. Increase the deformity to disengage the fractured ends, and then by traction and flexion of the wrist the lower fragment is manipulated into position.

If reduction is complete it is not of extreme importance what particular form of splint is used. Plaster of Paris is convenient and comfortable, but it has its disadvantages and in the writer's opinion is not the best form of splint for this particular fracture. Sir Robert Jones recommends thin, sheet metal splints, a posterior one extending from the external condyle of the humerus to the middle of the meta-carpals and an anterior one stopping short of the thenar eminence. The posterior splint runs slightly spirally from the ulnar side of the elbow to the radial side below and the anterior one has the twist in the opposite direction. The splints should be kept on for three weeks, allowing the patient light use of the fingers in the meantime. After three weeks the posterior splint should be removed and the patient gradually accustoms the wrist to ordinary work. The majority of surgeons advise the use of a general anaesthetic and in this the writer hearily concurs. In cases of long standing ,where the usual methods of reduction are not sufficient, much may be accomplished by the use of the Thomas wrench.

The most common injury to the wrist bones is fracture of the scaphoid, which according to one writer[3] occurs almost as frequently as Colles' fracture. Even without the aid of X-rays this injury in the acute stage should be readily diagnosed, but the frequency with which the condition is missed, renders it extremely important that all wrist injuries should be submitted to X-rays. When not diagnosed and consequently not treated, there is almost invariably a considerable amount of disability resulting and this will probably be permanent.

There is always a definite history of an injury, usually with the wrist in a hyper-extended position, followed promptly by swelling and tenderness, most marked in the "anatomical snuff-box." It is not infrequently carelessly diagnosed as sprained wrist, a condition which occurs very rarely. In the acute stage, the typical swelling, the severe pain that is made worse by every sort of movement, the acute tenderness just over the scaphoid distal to the radial styloid process, and the limitation of movement, especially of dorsiflexion of the wrist, make up a picture that is so absolutely characteristic, that it is always possible to diagnose fracture of the scaphoid with perfect confidence.

Todd, of London[4], in a recent article reviewing the cases of fracture of the scaphoid treated at Guy's Hospital, states that the great majority of cases that present themselves are examples of old fracture, and that the reason for attending is invariably the same, viz., that the wrist is not as good as it was or as it should be, and that it interferes materially with wage-earning capacity, either because it hurts or is weak, or for both reasons.

The usual cause of disability seems to be non-union and the secondary results, such as chronic arthritis, to which it gives rise. Codman and Chase[5] say, "If the fracture remains ununited, the permanent amount of disability is so great that it seriously interferes, not only with the comfort of the patient, but with his ability to enjoy certain games and sports, and also in the case of working men, it limits their working capacity and hence their ability to earn their living." The non-union may be partly due to the low power of repair in the carpal bones, and partly to the fact that the fracture surfaces are bathed in synovial fluid, but the chief factor seems to be mobility. The majority of cases that remain ununited give the history that the wrist was not put at rest for any length of time.

It is important, therefore, that the condition be recognized early and treated early. If there be displacement, and the displaced fragment cannot be manipulated into position and retained there, one or both fragments should be removed. Where there is no displacement, the treatment should consist in immobilization in a long cock-up splint for three weeks, followed by the usual physio-therapeutic measures. The average time which must elapse before full work can be resumed, is not far short of three months. If by this time function has not been restored, and the patient still complains of pain on movement, it is probably wise to operate and remove one or both fragments. Late operation is usually disappointing, and if put off until the joint is the seat of chronic arthritis, is doomed to failure.

Another injury to the wrist, which may occur alone or in conjunction with a fracture of the scaphoid, is dislocation of the semi-lunar bone. It is produced usually by a fall on the palm of the

XUM

hand with the wrist hyper-extended, in much the same way as a Colles' fracture is produced. The diagnosis is not difficult as a rule. There is marked disability and pain. The fingers are flexed and held rigid, owing to the pressure on the flexor tendons, and there is frequently numbness or tingling, owing to pressure on the median nerve. The diagnosis should, of course, be confirmed by X-rays. If seen early an attempt may be made to reduce the dislocation by manipulation under general anaesthesia. This failing, open reduction must be tried and as a last resort excision of the bone may have to be resorted to. If the dislocation be associated with fracture of the scaphoid, excision of the semi-lunar together with the proximal fragment or all of the scaphoid, will probably give the best functional result.

Fractures of the meta-carpal bones do not, as a rule, present any special difficulties. The fragments can usually be manipulated into position and maintained therein by a suitable palmar splint, or by strapping the hand and fingers over a thick roller bandage.

Fracture of the base of the first meta-carpal or as it is commonly called, Bennett's fracture, is best treated by means of a gutter-splint, with the thumb held, as so aptly described by Sir Robert Jones, in the position occupied when holding a glass of water.

Fracture of any of the meta-carpals or phalanges occasionally requires some extension. This can be obtained quite easily by means of adhesive tape or glue, and a suitable wire frame.

The question of fractures can hardly be disposed of without taking into consideration that of ischemic paralysis. This very disabling complication may be associated with fractures of the lower part of the fore-arm, though it is more commonly a sequel of fracture higher up. Unfortunately in the majority of cases the blame for its occurrence must be placed on the surgeon in attendance, and is due to too tight bandaging. It must not be forgotten, however, that it may be caused by pressure from within as it has been observed in cases in which no constricting dressing was applied. The pathology of the condition consists of a myositis, resulting in a fibrosis and consequent contracture. The damage is done within twenty-four to forty-eight hours, and the danger signal is pain. Here as elsewhere prevention is much better than cure, and preventative treatment consists in the careful application of well-padded splints, followed by careful supervision of the injured limb for the ensuing twenty-four hours. No patient with splints just applied should be discharged without definite instructions to return immediately or to remove the splints if the limb becomes painful.

The treatment of the established condition consists in gradually stretching the muscles, joint by joint, beginning at the fingers. Here again one cannot do better than quote Sir Robert Jones[9]. First: An assistant passively flexes the wrist to allow the fingers to extend and each finger is separately strapped to a little gutter-shaped splint, so that they cannot curl up. Second: A day or two later, or in milder cases at the same sitting, the metacarpo-phalangeal range is stretched and the palm and splinted fingers are bandaged to a flat metal splint. The whole hand and fingers are now rigidly extended with the wrist flexed. Third: The wrist is now from day to day extended a little and fixed. This is continued until the wrist is hyper-extended. This hyper-extension of wrist and fingers is maintained for some time in obedience to the principles laid down concerning the extension of scars, massage being systematically practised.

Injuries to Tendons

It is a matter of surprise how lightly the majority of text-books pass over the question of repair of tendons. One might easily arrive at the conclusion that no great difficulties are involved. On the other hand, Bunnell, of San Francisco, writes[6]: "One of the most baffling problems in surgery is to restore normal function to a finger in which the tendons have been injured. Anyone who can devise a method by which success can be almost guaranteed will be conferring a great blessing on the many sufferers from this type of injury, and in addition make a considerable financial saving for insurance companies." He is perhaps over pessimistic, but the fact remains that the repair of injured tendons of the hand is an operation which is often extremely disappointing in its results. This is particularly true of the flexor tendons. Good functional repair is much more easily obtained in the case of the extensors.

One can hardly dissect a hand without being impressed by its wonderful workmanship, and Bunnell says, "Though its tissues are tough and compact, its tendons, tendon sheaths, pulleys, joint surfaces, and flexible joint capsules all glide on each other so easily and smoothly that there is little in the refinement of motion

XUM

that the hand cannot do. If infection or trauma insults these perfected parts, a tissue reaction will occur, which will bind the gliding surfaces together, thicken and stiffen the joint capsules, congeal the tissues of the finger, strangulate the nerves and vessels and loss of function will result."

In no class of surgery is it more important that operation should be done with the strictest asepsis and utmost gentleness in the handling of tissues. Unfortunately, in the majority of cases, injury to the tendon is accompanied by an injury to the skin and other soft tissues, which is potentially septic. In all such injuries, therefore, an immediate cleansing of the wound and adjacent parts should be scrupulously carried out. Immediate suture of severed tendons, and if possible, repair of the tendon sheath as well, holds out the best prospect for complete restoration of function. If immediate repair cannot be done it is best to wait for complete subsidence of all infection before making the attempt. In either the early or late operation, if an incision must be made, its position is important. The median incision in the finger should never be used. A lateral incision will give the necessary exposure, do less damage to the tendon sheath, and is less liable to cause contractures.

Misunderstanding as to the action of the interossei and lumbrical muscles sometimes leads to errors in diagnosis. It should be borne in mind that these muscles act by flexing the metacarpophalangeal joints, and extending the interphalangeal ones.

In uniting cut tendons, failure is, as a rule, due either to the suture giving way or the tendon becoming fixed by adhesions. To prevent the former, various methods of inserting the sutures have been tried. It certainly is of little use to pass them through the whole thickness of the tendon and simply tie them together. They only cut their way out between the parallel bundles of fibrous tissue and fray out the end of the tendon. Of the numerous methods of suture, I will only mention a few. Burghard[7], in the *Oxford Surgery*, recommends what he calls the lateral suture. "A fully curved intestinal needle threaded with medium-sized catgut is made to pick up a small thickness of the tendon by introducing it transversely to the long axis about a quarter of an inch above the cut end. The tendinous bundles thus picked up are secured by knotting the suture firmly, and a similar suture is introduced and tied at a corresponding point in the tendon on the opposite side of the gap. It will be found that the two ligatures can be tied firmly together, and there will be no risk of their being pulled off the tendon to which they are attached. Two, three, or four of these double sutures are applied according to the size of the tendon, and they are reinforced by sutures of the finest catgut, which adapt the edges accurately after the lateral sutures have taken the tension."

Kanavels' suture has many points in its favour. "The sutures are so introduced and tied that none of the suture material appears on the surface and the knot is between the ends of the tendon. Fairly heavy silk, which has been smeared with vaseline so as to make the suture slip more easily, is threaded on a straight needle. The needle is now passed into the end of the tendon somewhat to one side of the centre and passes out of the side of the tendon about one-third of an inch from the cut end. It is then reinserted at the same point at which it made its exit, passed transversely across the long axis of the tendon making its exit upon the side about one-third of the way around; is again reinserted at the point of exit coming out on the side at the other third of the circumference. The needle is again reinserted at the same site, but now passes down and out the cut end of the tendon, not in the centre, however, but so as to cross the silk as originally inserted. The procedure is repeated with the other cut end. Fine coaptation sutures are applied."

Another useful suture is that described by Fuld, of New York. "The needle enters the tendon on its lateral surface half an inch above the cut end, passes transversely through the thickness of the tendon to emerge on the opposite side. The needle then enters the tendon on its anterior surface, at a point quarter of an inch from its cut end and three-fourths of the distance across the tendon. Perforating to half its anteroposterior thickness, it passes longitudinally through the length of the tendon emerging at its cut end to one side of the median line. The free end of the silk is crossed diagnonally over the other suture, perforates the tendon quarter of an inch from the cut and passes through the length of the tendon and emerges on the other side of the median line. Sutures are now passed in similar fashion into the other end of the cut tendon, and then tied to corresponding suture ends opposite, burying the suture knots between the approximated tendon ends."

The best suture material is probably silk, as catgut, especially if fine, is uncertain in durability and may give way before firm union has been established. It is important to have as little tension as possible on the sutures. Much can be accomplished in this way by judicious splinting. For example, if the injured tendon be a flexor of the middle finger, this finger should be put up in the flexed position, the remaining fingers in the extended position and the wrist slightly flexed.

To prevent adhesions it is important that the operation be done with as little damage as possible to the tissues, especially the tendon sheath. If passive motion could be begun immediately after operation and maintained, one would probably not be bothered with adhesions. But this is plainly impossible. It has been demonstrated that it requires six weeks for a cut tendon to become firmly united. Hence it would hardly be advisable to attempt passive motion within three weeks and voluntary motion within six weeks. By this time the tendon is usually firmly united and firmly fixed by adhesions. To get over this difficulty, Fuld advises a two stage operation. After the tendon is firmly united, he advises a second operation to free it from adhesions followed by early passive motion. In cases in which the tendon ends have become widely separated and cannot be brought together it may be necessary to resort to graft. These may be obtained from the palmaris longis, flexor sublimis, extensor communis, or other tendons, and should be dissected out with their sheaths.

Crushing Injuries

Injuries commonly called crushing injuries form a very large and important group. In the treatment of these cases, the essential considerations are the prevention of sepsis and the saving of tissue. One cannot hope to get aseptic wounds in every case, but much may be done by prompt application of antiseptics. Tincture of iodine is probably the most convenient and effective, and should be applied freely, first to the areas of skin about the wound, and then directly to the wound.

When the question of amputation presents itself, the watchword should be conservatism. Four years ago in company with Dr. Gallie, of Toronto, I had the privilege of seeing some of Dr. Putti's cinematic work in Bologna, and we were both greatly impressed by his wonderful ingenuity. His results in devising means of producing various movements in artificial hands were beyond praise, and one can only marvel that his methods have not been more widely adopted. But wonderful as these results were, the fact still remains that the hand with which nature endowed us, must be badly mutilated indeed, before it can be equalled by the best artificial mechanism yet devised. Hence it behooves us to amputate only when no form of treatment holds out any hope of preserving the injured part, and then to amputate as little as possible. Even a part of a thumb is of much greater value than any form of mechanical appliance. The smallest portion of a finger that can be saved is of value to the patient, and no tissue should be sacrificed to permit of the performance of any set amputation. In all amputation of fingers above the centre of the middle phalanx, the cut flexor tendons should be united either to the extensor tendon or to the soft parts in the region of the cut end of the bone.

There should, however, be a very clear line of difference shown between conservative treatment where there is a chance to save a member which will be useful to the patient and the saving of a member, which, when saved will be absolutely useless or even an obstacle in the performance of his duties.

Judicious application of pedunculated skin grafts will often do away with the necessity of amputating portions of fingers or thumbs. These grafts can be very conveniently taken from the abdominal wall. They should be applied only after removal of all scar tissue, and in shaping them, the length of the graft should never be more than three times the width. They should be a third larger than the area to be covered.

Nerve Injuries

Time will not permit any lengthy discussion of nerve injuries, which not infrequently complicate wounds about the wrist. An injury to the ulnar nerve is rarely unaccompanied by injury to tendons, but the median nerve lying subcutaneously at the wrist is frequently injured alone. When the median nerve is injured at the wrist without division of tendons, deep touch can be appreciated over the whole of the affected area. For this reason the division of the nerve is frequently overlooked, more frequently in fact according to Sherrin than division of all other nerves put together.

Division of the ulnar nerve is also frequently overlooked on account of the slight sensory disturbance produced. It is only by carefully

examining in a routine manner all injuries in the region of the wrist, that errors will be avoided. The treatment, of course, does not differ from that of nerve injuries elsewhere, and the prognosis is fairly good, particularly in the case of the median.

References

(1) Verrall, P. Jenner, *B.M.J.*, January 20th, 1923. (2) McKnight, *Surg. Gyn. and Obstet.*, June, 1922. (3) Knapp, *J.A.M.A.*, December 9th, 1922. (4) Todd, Allan H. *Brit. Jour. of Surg.*, July, 1921, p. 7. (5) Codman and Chase *Annals of Surg.*, 1905, p. 863. (6) Bunnell, *Surg. and Obstet.*, July, 1922. (7) Burghard, *Oxford Surg.* (8) Jones, Sir Robert., *Injuries to Joints.*

SEVERE INDUSTRIAL INJURIES TO THE FINGERS AND THEIR TREATMENT

C. Lightfoot Roman, B.Sc., M.D.

Montreal Cottons Limited, Valleyfield— P.Q.

INJURIES to the hand and fingers occupy a prominent place in the casualty list of any large industrial plant. This statement, no doubt, holds true in any centre of industry, but the safe-guarding devices, and the laws which compel machine protection, are slowly cutting down the number of accidents to the hand. It is difficult, however, to make mechanical appliances foolproof, so damage continues to be done in a direct ratio to the caution exerted by operators. In the textile industry this type of injury is seen more often than is any other.

In a cotton mill carrying a payroll of 2,300 employees; with 5,000 looms of English, Canadian, and American make, with 200,000 spindles; with all its own bleaching, dyeing and finishing departments; with machine shops; with a woodworking mill; with power-houses generating 16,000 horse-power; and with a large dairy farm thrown in for good measure, the writer is continually amazed at the very small percentage of serious finger and hand accidents. Slivers in the hand, avulsion of nails, emery-wheel and other abrasions, contusions, lacerations caused by rapidly moving knives and saws, burns that range from the electric type to those of scalds and chemical irritation, fractures—all these are treated with a desire, in the serious cases particularly, to prevent disability or at least to minimize it.

In a well equipped dispensary, which is an integral part of the plant, the patients are seen immediately after the accident. Here, nearly 7,500 cases, medical and surgical, are handled yearly. According to statistics, about sixteen per cent. of the total surgical cases are finger and hand injuries, or a little over 1,200

Keeping in mind that the hands are of first importance in the equipment of the average worker, and that the wage-earning capacity of these hands must be preserved as nearly intact as possible, the efforts of the industrial surgeon are directed toward minimizing any threatened disability. Among the injuries most likely to produce disability, (traumatic amputation being included) are severe crushing, causing damage to the bones and joints, and severe lacerations involving tendons, or burns leaving a scar tissue and deformity as *sequelae*. Any accident to the hand or fingers which throws into relief a prospect of decreased efficiency in the present occupation or promises to hinder in other types of work must be considered serious. The courts of any large industrial centre demonstrate some of the serious aspects of these injuries when these tribunals are clogged with claims for disability. The Workmen's Compensation Act has attempted to place a definite value upon the loss or impaired function of each finger, but even this forward step does not meet with unanimous approval among surgeons, as some authorities feel that sufficient emphasis has not been put upon this subject.

In the cases seen and treated by the writer, injury never extended farther than the proximal portion of the third phalanx of any finger. In the textile injury it seems a rule that the distal portions receive the brunt of damage. Possibly this is explained by the rapid methods for stopping even ponderous machinery or by the quick with-

drawal from the danger zone. Very often the accident produces such a mangled mass that surgical wisdom dictates amputation with the alluring vision of healing by primary intention and a short absence from work; but policy and hope withhold action. Here is the Scylla and Charybdis of the industrial surgeon's existence; if he can always manage to steer a course between the two and achieve the golden mean, he will gain the everlasting gratitude of the worker, and incidentally cut down accident insurance rates. Save first, correct afterwards. In all injuries that require long treatment, the consideration of a final good functional and cosmetic condition plays no small part. Frequently perfect function goes along with a deformity which may be the basis of a claim for compensation.

In each of the case reports presented below, there was laceration of tissue, bone damage, and subsequent infection. The preliminary treatment consisted of cleaning up the parts with gasoline and green soap as the majority of the wounds were covered with grease and dirt; iodine was then applied. Dr. Irving Clark, at the Norton Company, Worcester, Mass., states that in ordinary abrasions and lacerations, the technique of gasoline and iodine cut down the incidence of infection to one per cent. Every living bit of tissue was salvaged, and if fracture complicated the condition splints were used to immobilize. It was very difficult to forestall infection in these serious cases; it may be done, but the writer has not yet had the good fortune to avoid this *bete noire*. As soon as this condition supervened a bath was used with a hot solution—boric acid was found to be as good as any. In a few of the cases Wright's and Dakin's solution were tried, but no better results were observed than with boric solution.

The patient was brought to the dispensary every morning and his hand was kept in the bath for two or three hours. After this the wound was covered with a dry gauze dressing which contained one to three drams of boric acid powder and the invalid was sent home with instructions to immerse his hand, without disturbing the bandage, in a basin of water as hot as he could endure comfortably. He was to do this for half an hour every two hours. In following this routine there is the possible inconvenience of the tissues becoming waterlogged, especially in cases where the injury has been extensive. This was overcome by stopping the solution treatment, swabbing with iodine and allowing an interval of a day or two. Very often the patient became discouraged at the slow progress made and needed strong assurance that the finger would eventually be better than a stump. It is a distinct pleasure after days and days of treatment to see the gradual improvement and the final healing. Stiffness, sensitiveness, limitation of joint movement follow in varying degrees, but these disappear with massage and movement both passive and active. At this period the patient is sent to his work and is kept under medical supervision until he is following his occupation without any discomfort. In only two of the cases seen was the damage so severe as to indicate amputation—all the others obtained results which enabled them to resume their work with an inconsiderable disability.

The frequency with which these serious finger injuries occur and the almost miraculous response they make to conservative treatment convinces the writer that the policy of saving first and correcting afterwards should be followed more widely, above all in industrial surgery.

Summary of Case Reports

Leo. L., age 17, injured November 22nd, 1922.—Caught right index finger in a rapidly moving shearing machine. Distal portion mangled beyond hope of saving. Distal joint opened and destroyed. Amputated just above the head of the second phalanx, saving as much of the palmar tissue as possible to make a good flap. Became slightly infected. . . . moist dressings and bath of hot boracic acid solution. Resumed work thirty-nine days later with a splendid stump.

Chas. C., age 41, injured January 29th, 1923.—Distal phalanx left thumb lacerated on a circular saw, fracturing the distal phalanx; nail was torn; infection followed with portion of phalanx sloughing out. Followed hot solution treatment with perfect result. Discharged seventy-two days after accident.

Irene F., age 16; injured February 10th, 1923.—Right hand caught in a comber. Very severe laceration of middle finger extending to the head of the proximal phalanx with fracture of the distal and second phalanges; laceration and fracture of the distal phalanx of the little finger; in both fingers the nail was torn out; portions of tissue and fragments of bone removed. Fingers dressed and placed on splints. Here, obviously, the indication was to amputate; but it was decided to attempt to save the fingers, particularly the middle one. After eighty-six

days the girl was sent to her work with her fingers only slightly sensitive and with a very slight limitation of movement in the second joint of the middle finger.

Henri B., age 37; injured March 13th, 1923.—Distal portion of left little finger caught in the crank shaft of a loom and all but amputated. Distal phalanx was fractured. The lacerated fragment was strapped into position and union occurred within two days. Infection set in and hot solutions were resorted to. A perfect plastic and functional result was obtained in forty-one days.

Joseph D., age 15; injured April 17th, 1923.—Right middle finger caught in gears....Distal phalanx crushed and lacerated; the tissue over the palmar surface of the second phalanx deeply lacerated. A long palmar flap was used and sutured to the dorsum of the finger after the phalanx had been removed. Returned to work with a good stump after forty-one days.

RETRO-PHARYNGEAL ABSCESS; AND EROSION OF INTERNAL CARODID ARTERY; WITH PATHOLOGICAL SPECIMEN*

D. E. S. WISHART, B.A., M.B., *Toronto*

Assistant Surgeon, Department of Laryngology, Hospital for Sick Children, Toronto; Junior Demonstrator, Department of Oto-laryngology, University of Toronto

THE unique pathological specimen which accompanies this paper, I owe to the kindness of the Surgical Staff of the Hospital for Sick Children, to whose service the case was admitted in August, 1922. The possibility of the occurrence of the fatal complication of which this case is an illustration is mentioned in several of the references given below, and four similar cases were reported by Carmichael[1] in 1881, Lidell[2] in 1883, Travers[3] in 1902, and Wylie and Wingrave[4] in 1906, but no evidence has been found to show that a specimen illustrating the condition exists in any other collection.

Advantage has been taken of the opportunity presented by this specimen to investigate the records of cases of retro-pharyngeal abscess at the Hospital for Sick Children in order to glean from them a composite clinical picture of the symptoms, signs, course, and fate of actual cases. The tabulation of these cases has been made in the last eight years only and the records have been found deficient in many respects. For example, one record gave but a few lines of history and a good description of the position of the abscess, while another had an excellently written story of the illness and no description of the throat. This report therefore is not to be considered final. An effort is now being made to greatly raise the standard of our case histories so that future reports may be sufficiently accurate for statistical purposes.

Definition.—A retro-pharyngeal abscess is a collection of pus in the connective tissue beneath the mucous membrane of the posterior wall of the pharynx.

Anatomy.—The anatomy of the posterior wall of the pharynx will be readily understood by careful consideration of the following three cross-sections taken from Eycleshymer and Shoemaker[5]. The first cross-section (Figure I) is cut through at the level of the hard palate. Directly behind the mucosa of the pharynx is a thin strip of muscle continuous at the sides with the palate—the M: pharyngo-palatinus (Palato-pharyngeus). Behind this muscle a thin layer of connective tissue, which becomes broader at the sides represents the retro-pharyngeal space at this level. It is bounded posteriorly by two muscles—the M. longus capitis (rectus capitis anticus major) and the M. rectus capitis anterior (rectus capitis anticus minor). At the sides the retro-pharyngeal space is continuous with the pharyngo-maxillary fossa—a fossa having firm muscle boundaries, but a fossa in name only, for it is completely filled by connective tissue and important vessels and nerves.

*From the Department of Oto-laryngology University of Toronto, Toronto.

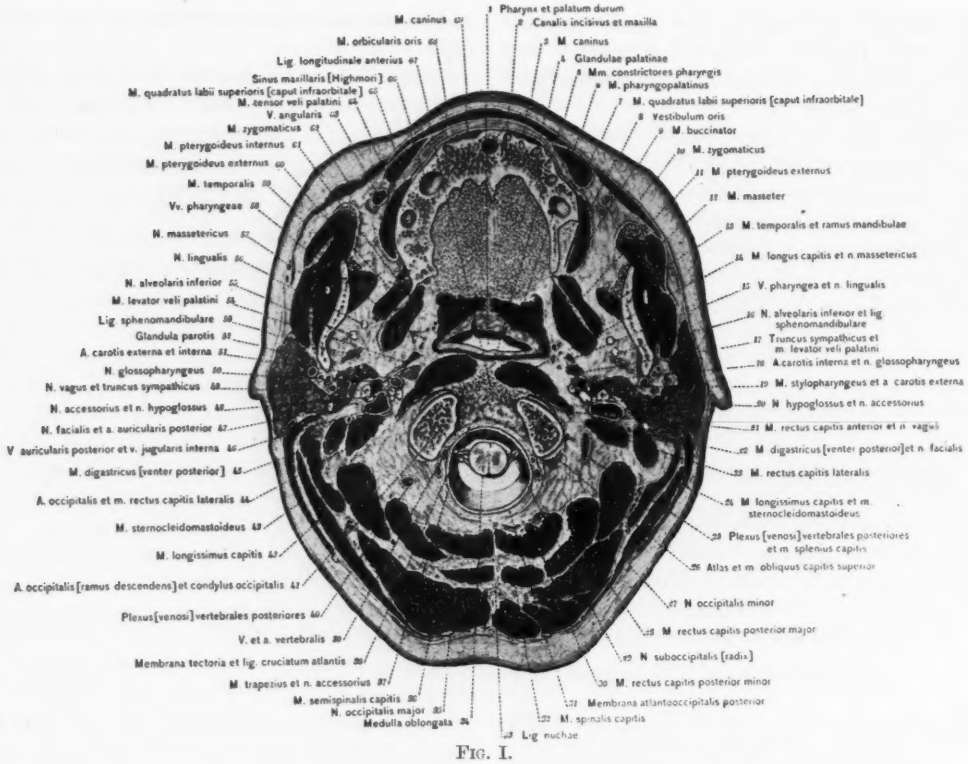
1 Pharynx et palatum durum
2 Canalis incisivus et maxilla
3 M. caninus
4 Glandulae palatinae
5 Mm. constrictores pharyngis
6 M. pharyngopalatinus
7 M. quadratus labii superioris [caput infraorbitale]
8 Vestibulum oris
9 M. buccinator
10 M. zygomaticus
11 M. pterygoideus externus
12 M. masseter
13 M. temporalis et ramus mandibulae
14 M. longus capitis et n. massetericus
15 V. pharyngea et n. lingualis
16 N. alveolaris inferior et lig. sphenomandibulare
17 Truncus sympathicus et m. levator veli palatini
18 A. carotis interna et n. glossopharyngeus
19 M. stylopharyngeus et a. carotis externa
20 N. hypoglossus et n. accessorius
21 M. rectus capitis anterior et n. vagus
22 M. digastricus [venter posterior] et n. facialis
23 M. rectus capitis lateralis
24 M. longissimus capitis et m. sternocleidomastoideus
25 Plexus [venosi] vertebrales posteriores et m. splenius capitis
26 Atlas et m. obliquus capitis superior
27 N. occipitalis minor
28 M. rectus capitis posterior major
29 N. suboccipitalis [radix]
30 M. rectus capitis posterior minor
31 Membrana atlantooccipitalis posterior
32 M. spinalis capitis
33 Lig. nuchae
M. caninus 3
M. orbicularis oris 64
Lig. longitudinale anterius 67
Sinus maxillaris [Highmori] 66
M. quadratus labii superioris [caput infraorbitale] 65
M. tensor veli palatini 62
V. angularis 63
M. zygomaticus 61
M. pterygoideus internus 61
M. pterygoideus externus 60
M. temporalis 59
Vv. pharyngeae 58
N. massetericus 57
N. lingualis 56
N. alveolaris inferior 55
M. levator veli palatini 54
Lig. sphenomandibulare 53
Glandula parotis 52
A. carotis externa et interna 51
N. glossopharyngeus 50
N. vagus et truncus sympathicus 49
N. accessorius et n. hypoglossus 48
N. facialis et a. auricularis posterior 47
V. auricularis posterior et v. jugularis interna 46
M. digastricus [venter posterior] 45
A. occipitalis et m. rectus capitis lateralis 44
M. sternocleidomastoideus 43
M. longissimus capitis 42
A. occipitalis [ramus descendens] et condylus occipitalis 41
Plexus [venosi] vertebrales posteriores 40
V. et a. vertebralis 39
Membrana tectoria et lig. cruciatum atlantis 38
M. trapezius et n. accessorius 37
M. semispinalis capitis 36
N. occipitalis major 35
Medulla oblongata 34
Lig. nuchae 33

FIG. I.

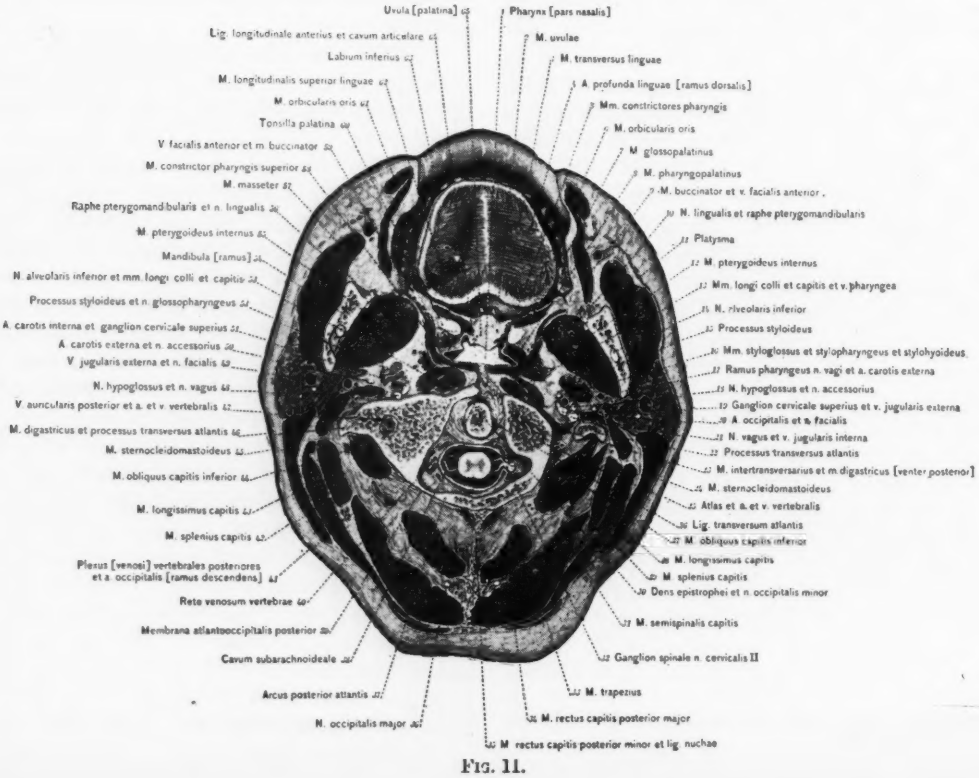
1 Uvula [palatina]
2 Pharynx [pars nasalis]
3 M. uvulae
4 M. transversus linguae
5 A. profunda linguae [ramus dorsalis]
6 Mm. constrictores pharyngis
7 M. orbicularis oris
8 M. glossopalatinus
9 M. pharyngopalatinus
10 M. buccinator et v. facialis anterior
11 N. lingualis et raphe pterygomandibularis
12 Platysma
13 M. pterygoideus internus
14 Mm. longi colli et capitis et v. pharyngea
15 N. alveolaris inferior
16 Processus styloideus
17 Mm. styloglossus et stylopharyngeus et stylohyoideus
18 Ramus pharyngeus n. vagi et a. carotis externa
19 N. hypoglossus et n. accessorius
20 Ganglion cervicale superius et v. jugularis externa
21 A. occipitalis et n. facialis
22 N. vagus et v. jugularis interna
23 Processus transversus atlantis
24 M. intertransversarius et m. digastricus [venter posterior]
25 M. sternocleidomastoideus
26 Atlas et a. et v. vertebralis
27 Lig. transversum atlantis
28 M. obliquus capitis inferior
29 M. longissimus capitis
30 M. splenius capitis
31 Dens epistrophei et n. occipitalis minor
32 M. semispinalis capitis
33 Ganglion spinale n. cervicalis II
34 M. trapezius
35 M. rectus capitis posterior major
36 M. rectus capitis posterior minor et lig. nuchae
Uvula [palatina] 63
Lig. longitudinale anterius et cavum articulare 64
Labium inferius 67
M. longitudinalis superior linguae 62
M. orbicularis oris 61
Tonsilla palatina 60
V. facialis anterior et m. buccinator 59
M. constrictor pharyngis superior 58
M. masseter 57
Raphe pterygomandibularis et n. lingualis 56
M. pterygoideus internus 55
Mandibula [ramus] 54
N. alveolaris inferior et mm. longi colli et capitis 53
Processus styloideus et n. glossopharyngeus 52
A. carotis interna et ganglion cervicale superius 51
A. carotis externa et n. accessorius 50
V. jugularis externa et n. facialis 49
N. hypoglossus et n. vagus 48
V. auricularis posterior et a. et v. vertebralis 47
M. digastricus et processus transversus atlantis 46
M. sternocleidomastoideus 45
M. obliquus capitis inferior 44
M. longissimus capitis 43
M. splenius capitis 42
Plexus [venosi] vertebrales posteriores et a. occipitalis [ramus descendens] 41
Rete venosum vertebrae 40
Membrana atlantooccipitalis posterior 39
Cavum subarachnoideale 38
Arcus posterior atlantis 37
N. occipitalis major 35

FIG. II.

Descending to the next section (Figure II)—at the level of the tongue—the retro-pharyngeal space is less evident, but the pharyngo-maxillary fossa is better defined than in the preceding section. The pharyngeal veins are now fewer in number but of larger calibre and lie in the outer edge of the superior constrictor of the pharynx. Just lateral to them is seen a bundle of muscles—the M. styloglossus, M. stylopharyngeus, and M. stylohoideus—which in their descent divide

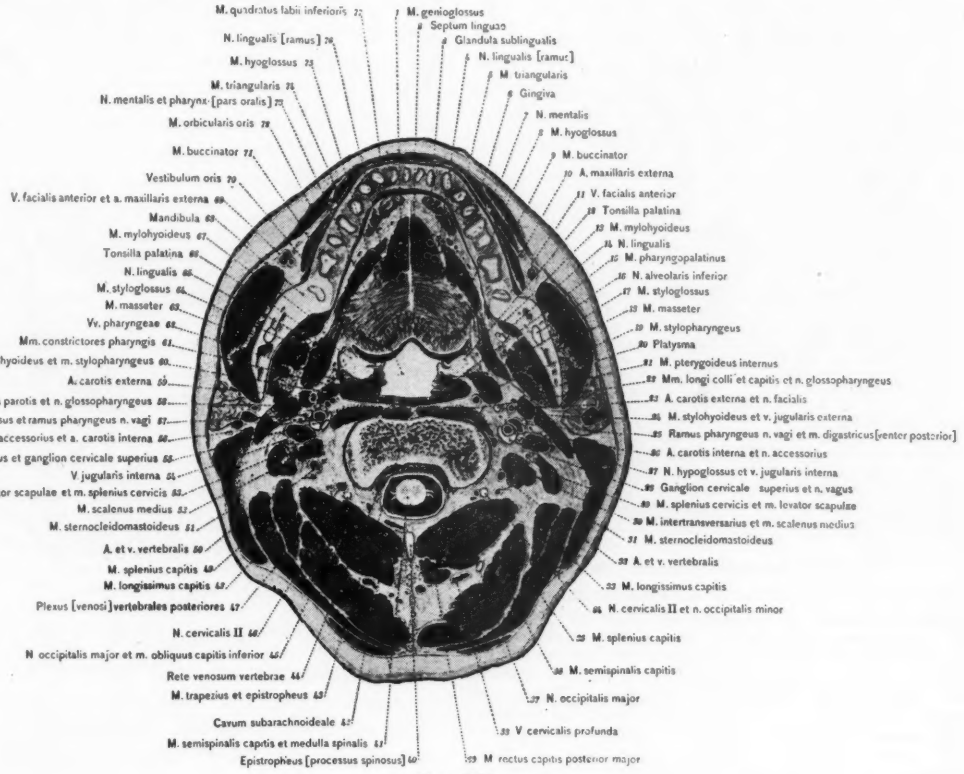

FIG. III.

the pharyngo-maxillary space (Figure III) into an anterior chamber contiguous with the tonsil, and a posterior chamber containing in its hindermost part the internal carotid artery, the internal jugular vein, and their accompanying nerves. It is this posterior compartment which merits our attention in the consideration of the pathological specimen here presented. Figure III. shows well the broad band of connective tissue which is continuous laterally with the posterior compartment of the pharyngo-maxillary space and its main structure the internal carotid artery.

In the midline the retro-pharyngeal connective-tissue is condensed into a fairly resistent raphe, which binds the midline of the pharyngeal mucosa to the spine, so that a suppurative process which is opening up a space in the retro-pharyngeal connective-tissue on one side will not readily spread to the opposite side.

Theoretically the retro-pharyngeal space extends upwards to the septum nasi. Practically it extends but a short distance upwards owing to the fact that the subpharyngeal connective-tissue binds the mucosa very firmly to the anterior face of the basilar process of the occipital bone. Downward there is almost no limit to the theoretically possible extension. The retro-pharyngeal space may merge into the retro-oesophageal space.

Figure IV taken from St. Clair Thomson[6], illustrates the vertical extent of a retro-pharyngeal abscess and, therefore, of the retro-pharyngeal space. It will be seen that the cavity extends from the level of the basi-occipital above to that of the fifth cervical vertebra below; the swelling is greatest opposite the body of the second cervical vertebra. The way in which

pressure can be exercised on the upper opening of the larynx is well illustrated.

So much, therefore, to demonstrate the existence and position of the retro-pharyngeal space and its lateral connection.

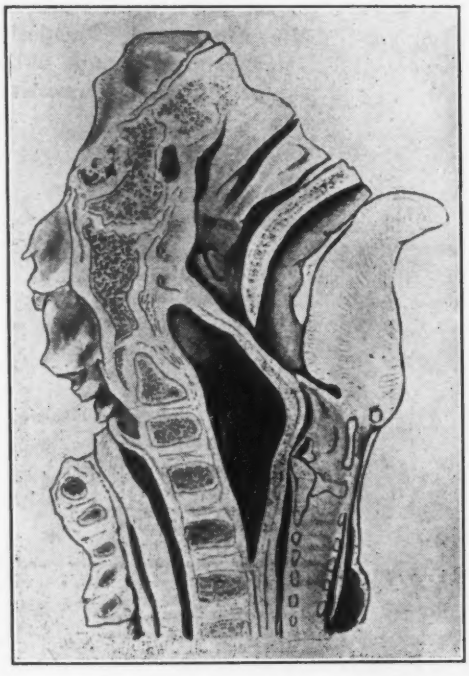

FIG. IV.—RETROPHARYNGEAL ABSCESS

Section through the cervical vertebræ, pharynx, and adjacent parts of a boy aged 2½, showing the cavity of a retropharyngeal abscess. The abscess extends from the level of the basi-occipital above, to that of the 5th cervical vertebra below; the swelling is greatest opposite the body of the 3rd cervical vertebra. The abscess cavity is lined by a brownish membrane; the posterior pharyngeal wall, which forms the anterior boundary of the cavity, appears thickened. The way in which pressure has been exercised on the upper opening of the larynx is well illustrated. There is no evidence of spinal caries, nor anything to explain the cause of the abscess. (*St. Bartholomew's Hosp. Mus., No.* 1841*a*.)

The first three figures are photographs of sections of the adult body and show no lymph-nodes in the retro-pharyngeal space. According to Most[7] and to Delamere, a few lymph-nodes are found in infancy beneath the mucous membrane of the pharynx, that is, in the retro-pharyngeal space; but these nodes are said to atrophy before the fifth year in the great majority of cases.

These retro-pharyngeal lymph-nodes are arranged in four groups, two on each side of the midline of the pharynx. They vary in size and number in each group but their general arrangement is vertical. The lateral group is found median to the internal carotid and is described as more constant than the medial group which lies in the retro-pharyngeal space closer to the midline. Both groups receive some afferent lymphatic vessels from the accessory nasal sinuses, the nasal fossae, the naso-pharynx, and pharynx, and send efferent vessels to the internal jugular group of the posterior deep cervical chain. Fairly constant in the first years of life these lymph-nodes rapidly undergo retrogression, so that whereas ten or more may be found in the infant there will rarely be found more than one in the entire retro-pharyngeal space of the adult.

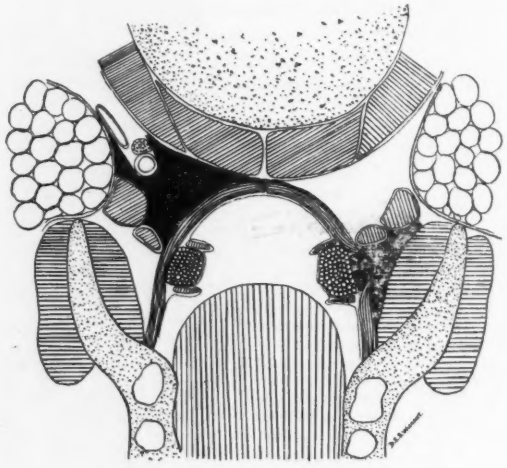

FIG. V.

Figure V is diagrammatic, but a close approximation to the exact anatomy as shown by cross sections, and is the result of my observations while studying this region under the instruction of Dr. H. P. Mosher, who has been prominent in emphasizing the importance of the pharyngo-maxillary fossa[10]. The advantages of this representation are as follows: it shows that the large vessels lie in the centre of the space: it emphasizes the fact that the lateral extension of an abscess would show as a bulge under the lower edge of the parotid in the upper part of the neck: and it demonstrates how a peritonsillar abscess will tend to locate in the pterygoid compartment of the pharyngo-maxillary fossa and have difficulty in extending either to the carotid sheath or to the retro-pharyngeal space proper.

Further the diagram indicates the structures penetrated by the incision into a retro-pharyngeal abscess, which are: 1, the pharyngeal mucosa; 2, the pharyngeal aponeurosis; 3, the superior

constrictor muscle; 4, the bucco-pharyngeal fascia, (compare left side of Figure II); 5, the loose areolar tissue of the retro-pharyngeal space.

The median raphe of the pharynx has been emphasized. The superior constrictor muscle has been represented by lines parallel to the pharynx to indicate that the fibres of the muscle are more horizontal in their course than they are perpendicular which is the anatomical reason for our preference for using a vertical incision.

Etiology.—Theoretically suppuration may occur in the tissues between the mucous membrane of the posterior wall of the pharynx and the spine, as the result of: 1, injury to the posterior wall of the pharynx from blows or foreign bodies; 2, the burrowing of pus from other regions; 3, caries of the spine; and 4, suppuration in the retro-pharyngeal lymph-nodes.

During the last eight years there have occurred at the Hospital for Sick Children, forty-one cases of retro-pharyngeal abscess. Not one of these have been known to be the result of any of the first three theoretical causes just mentioned. This series may, therefore, be considered to be due in 100 per cent. of cases to suppurative lymphadenitis.

In twenty-four of the forty-one cases the onset was without assigned cause, but in seventeen, or forty per cent., there was an accompanying infectious process in the nose or ears.

Retro-pharyngeal Abscess
Etiology

Total cases of retro-pharyngeal abscess	41
Cases preceded by a definite illness	17
Cases of unknown origin	24
Cases accompanied by acute otitis media	7
Cases accompanied by naso-pharyngitis	9
Cases accompanied by cervical adenitis	25

Pathology.—The process is essentially first an adenitis, then a periadenitis, and finally a breaking down with suppuration and the formation of an abscess.

In twenty-six cases the abscess was described as definitely unilateral; in only a few cases was it noted that the abscess extended especially downward; in no case was it seen to extend much above the level of the soft palate; so that it may be concluded that the majority were confined to the oro-pharyngeal region.

The cervical lymph-nodes below and behind the angle of the lower jaw on the side of the abscess were enlarged or indurated in twenty-five cases, or sixty-one per cent. They were noted as inflamed in one case only. In one recent case the unilateral cervical swelling which was visible from a distance disappeared at once following the internal incision of the abscess, the reason for which can be easily understood by the study of plate No. V.

The age of the youngest child affected was four months; that of the oldest was thirty-six months; the average age was fifteen months.

Symptoms.—It is manifest that the condition is essentially one of infancy. The onset is, therefore, obscure, and dependence for history has to be placed upon parents who are frequently poor observers. Careful tabulation of our records shows that by far the most frequent causes for the anxiety of the parents were: 1, that the child was breathing or swallowing with difficulty and, 2, the appearance of swelling on one side of the neck.

Retro-pharyngeal Abscess
Complaint of Parent on admission of Child

Swelling in the neck	24
Breathing with difficulty	23
Difficulty in swallowing	16
Coughing	10
Feverish	10
Nose running	9
Ear running	7

The history has usually been meagre. The impression is gathered that the onset was acute in eleven cases or twenty-seven per cent., and insidious in twenty-eight cases or sixty-eight per cent.; and that, as a rule, the diagnosis has been made at the first examination of the child.

The clinical picture presented by the average case can be best understood by an examination of the signs presented by our series of cases.

Retro-pharyngeal Abscess
Examination of child at time of Admission

Acutely ill	24
Not acutely ill	13
Head markedly retracted	11
Highest temperature	104.6°
Lowest temperature	98°
Average temperature	100.4°
Cervical glands markedly enlarged	25
Marked dyspnoea	26
Retro-pharyngeal swelling noted as definitely unilateral	26

Diagnosis.—The examination of a sick child, especially one with marked swelling of the cervical glands and with history or signs of difficulty in breathing or swallowing would be criminally inadequate without examination of the throat. This should reveal to the physician the presence of any pharyngeal swelling and hence lead to the consideration of the probability of retro-pharyngeal abscess.

Yet the pharyngeal examination is the step most often accompanied by error. Our records

show that one case was sent to the operating room for removal of tonsils and adenoids. The operator, the chief of the laryngological service, looked in the child's mouth, put away the tonsillectomy instruments, evacuated the abscess and has since refused to countenance operation on the throat without previous examination by one of his own department.

There are two factors which are responsible for the non-recognition of the condition. The first is its relative infrequency. The majority of any class graduating in medicine will not have seen a single case. During the last eight years there have been 33,892 new cases admitted to this hospital and yet a total of only forty-one cases of retro-pharyngeal abscess has been found. The second factor is the great difficulty of making a satisfactory examination of the inflamed throat of an infant or young child, especially if the child be seen at home in the arms of an apprehensive or perhaps indignant parent. The sympathetic physician working under disadvantageous conditions tends to relinquish his efforts before he has completed his examination and palpation. The detection of fluctuation in the swelling should at once lead to the diagnosis, but the anatomic relations of the parts may be thrown into chaos by the squirming of the child or the palpating finger may be untrained.

However, having determined the presence of a fluctuating swelling the physician must endeavour to rule out several possibilities before he diagnoses the condition under discussion here. Tuberculous disease of the vertical spine is rare but must be considered if there is history of rigidity of the neck of long standing, or if the child hold its head in its hands. In such a case it will be apparent that treatment can be delayed long enough to procure an X-ray photograph of the neck. Aneurysm of the carotid will be excluded by the absence of pulsation. In spinal osteomyelitis the symptoms will be very acute with high fever.

If, on the other hand, there be swelling but no fluctuation the possibility must be considered of lymphadenitis of the retro-pharyngeal nodes without the formation of pus, or of an acute pharyngitis in the throats of patients suffering from cervical scoliosis.

Progress.—In three cases the abscess had been opened prior to admission; in two cases the abscess was opened more than once; in nineteen cases the abscess was opened on the day of admission and in the cases so treated the fever, in all cases but six, lasted for not more than forty-eight hours following the evacuation of the abscess. Only one case died and it was the only case which presented any of the possible complications described in the references.

Treatment.—Many and various are the methods enumerated in the texts, for the procedure to be followed in the surgical treatment of this condition. The procedure to be described is that followed and taught by the laryngological service of the Hospital for Sick Children.

A case of retro-pharyngeal abscess is always to be considered an emergency, to be admitted at once for immediate evacuation of the abscess, and to be given constant supervision until out of danger. The operation is to be considered dangerous but at the same time safe if it is properly performed.

No anaesthetic is necessary. The child is swathed, placed on its back on a table, and a mouth gag inserted. The assistant stands behind the child's head, holds it between his two hands, and turns the head so that the abscess is on the lower side. Under inspection by reflected light the tongue is depressed by a suitable tongue depressor held by the surgeon in his left hand. The surgeon then takes in his right hand a pair of special pointed tonsil scissors, which he passes closed into the child's mouth until they touch the apex of the pharyngeal swelling. The scissors are plunged through the mucosa and the superior constrictor muscle covering the swelling, and opened wide so as to make a vertical slit and pulled out while still widely open.

All this is but the work of a few seconds. The important part of the operation is to follow. It consists in the attendant at once rolling the child on its side while the surgeon with the tongue depressor holds the tongue down and the cheek open so that the pus unable to find its way into the trachea and larynx flows freely out of the mouth. No local after-treatment is necessary.

The above procedure sounds and, in good hands, looks very simple; but the student, being taught an operation he may have to perform as an emergency, is cautioned that he must know what he is going to do, must be able to see where he is working, and must do what is to be done quickly. A child with this condition may easily and rapidly die if the operator bungle his job.

Of the forty-one cases at this hospital diagnosed as retro-pharyngeal abscess in the past eight years and given the treatment described, not one has been a fatality. One case which

was not diagnosed, died and was found to have been suffering from retro-pharyngeal abscess—the case about to be reported.

E. B., 18 months old, was perfectly well until three weeks previous to being seen when a patchy sore throat developed. Two weeks later a swelling in the side of the neck appeared which was fomented and went down gradually. The child was playing about on the day before admission. On the morning of the day of admission it had a sudden haemorrhage from the mouth and lost about a bowlful of fairly dark clotted blood; and in the evening about seven o'clock had a similar haemorrhage of about a cupful of blood of a brighter red colour and more fluid. The signs of exsanguination were then very marked, the mucous membranes being almost white.

The child was brought to hospital for transfusion about eleven o'clock that night, was extremely anaemic and died within two minutes of reaching the admitting room. As the child had not been examined, a clinical diagnosis of haemorrhage, probably gastric, was made, but the autopsy revealed the true diagnosis of retro-pharyngeal abscess with erosion of the internal carotid artery, (Figure VI).

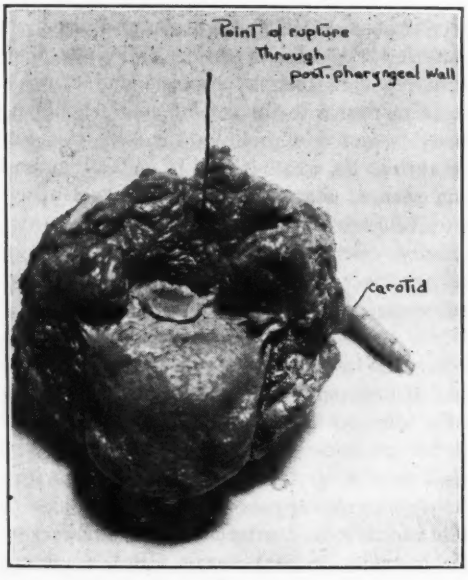

FIG. VI.

On dissecting the retro-pharyngeal tissue just to the left of the middle line of the pharynx there was found an abscess cavity which would hold about a drachm of fluid and which contained dark red clots. It had spread into the pharynx just to the left of the mid-line by an opening one-half centimetre in diameter. The wall of the internal carotid artery (Figure VII) was eroded for a distance of about two centimetres and lay on the posterior wall of the cavity. The tissues about the cavity were red and boggy.

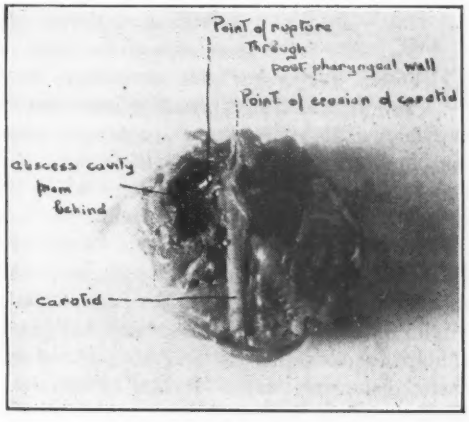

FIG. VII.

A section made of the tonsil on the side of the abscess showed no inflammatory change. The muscle wall of the tonsillar fossa was intact and thick. The abscess was, therefore, definitely retro-pharyngeal and not peritonsillar, and had extended laterally in the posterior compartment of the pharyngo-maxillary space and involved the internal carotid artery.

All of which demonstrates the truth of the maxim of Georges Laurens—"A retro-pharyngeal abscess not diagnosed and not opened is fatal to the child; nearly all treated appropriately, recover."

BIBLIOGRAPHY

(1) CARMICHAEL, J.; Retro-pharyngeal Abscess in an infant; sudden death by haemorrhage; *Edinburgh Medical Journal*, 1881, 27, July 24. (2) LIDELL, J. A.; On certain abscesses of the neck which may cause sudden death, and how to treat them with success; *American Journal Medical Science*, 1883, 86, 321, October. (3) TRAVERS, F. T.; Retro-pharyngeal Abscess; secondary haemorrhage; ligature of internal jugular vein and common carotid artery on left side; recovery; *British Medical Journal*; 1902, 2: 703, September 6. (4) WYLIE, A., AND WINGRAVE, V. H. W.; A case of retro-pharyngeal abscess in a female aged 21 years; evacuation of pus for dyspnoea; death from sloughing of the internal carotid; *Lancet*, 1906, 1: 1042; April 14. (5) EYCLESHYMER AND SHOEMAKER; *Cross-section Anatomy*, New York, Appleton and Co. (6) THOMSON, SIR ST. CLAIR; *Diseases of the Nose and Throat*; London, New York, Toronto and Melbourne: Cassell & Co. Ltd.; 1916. (7) MOST; *Chirurgie der Lymphgefasse und der Lymphdruse*, 1917, p. 27. (8) MOSHER, H. P.,; Deep Cervical Abscess and Thrombosis of the Internal Jugular Vein; *Transactions of the American Laryngological, Rhinological and Otological Society*, 1920. (9) FRANK, I.; Retro-pharyngeal Abscess; *Journal of the American Medical Association*, 1921, Vol. 77, August 13. (10) PIERSOL, G. A.; *Human Anatomy*; Philadelphia and London: J. B. Lippincott Company, 1908.

XUM

THE PATHOLOGY OF ENDEMIC GOITRE

JAMES MILLER, M.D.

Professor of Pathology, Queen's University, Kingston

BEFORE discussing the pathology of the various forms of thyroid enlargement usually known as goitre there are certain general considerations to be dealt with regarding the structure and function of the gland which have an important bearing on the question.

The thyroid is an organ which stands by itself. No other gland resembles it in structure with the possible exception of the pars intermedia of the pituitary. The lung also has certain similarities consisting as it does of alveoli with elastic distensible walls. But of course the air vesicles communicate with duct structures which are absent from the thyroid gland, at least in post-embryonic life. No tissue or organ of the body shows the same specific affinity for an inorganic substance as does the thyroid for iodine. Again, there is no organ in which it is quite so difficult to differentiate increased physiological activities, regenerations, and hypertrophy from true tumour formations, with the exception, possibly, of the prostate gland.

As Marine points out in an extremely useful review of the functions of the thyroid gland (*Physiological Reviews*, Vol. II, No. 4, 1922) more is known about the thyroid, its embryology, its anatomy, its physiology, its pathology, and its pharmacology than is the case with any other gland, but as regards its influence on the various tissues of the body and the inter-relationships of the thyroid with the other endocrine organs we are only at the commencement of our knowledge.

Glands vary somewhat in their capacity to respond to stimuli and to alter structure in so doing. In this respect, also, the thyroid is probably unique in that the response is peculiarly rapid. Moreover, the series of structural alterations or evolutions through which the gland goes, following the stimulation, is always the same. Hence, when certain appearances are visible with the microscope, we can say with confidence that the gland is showing increased activity. There appears an increase in the size of the cells lining the alveoli, so that from being low cubical they become high columnar. At the same time the cells increase in number, and in association with this, the stroma increases and plications appear in the alveolar walls with consequent formation of intra-alveolar papillomatous processes. Coincident with this change is an alteration in the colloid, first it loses its characteristic affinity for acid dyes such as eosin, taking on eventually the basic dye and becoming at the same time granular instead of homogeneous in appearance. Ultimately, the material in the alveoli tends to disappear altogether. During all this period of increased cellular activity, there is an increase in the vascularity of the organ and the whole gland enlarges.

The stimuli which induce this increased activity are various. The following are the more important. First comes deficient ingestion of iodine as shown by the fact that experimental deprivation induces hyperplasia and also by the fact that the administration of iodides in any form prevents such hyperplasia and causes the gland to return to the resting stage should it already be actively proliferating from this cause. Conditions in which there is general malnutrition such as starvation and also such diseases as rickets are accompanied by increased thyroid activity. Certain diets especially those rich in proteins and fats, by increasing the rate of iodine discharge, produce hyperplasia. The influence of the sex glands in the same direction is illustrated by the increased activity of the thyroid in pregnancy and at puberty. Then there is the influence of other ductless glands of which, so far as present knowledge goes, the suprarenal is the most important. The cortex of the suprarenal appears to exercise some control and if this control is removed increased glandular action may result. But a more definite influence is exerted by the medulla of the suprarenal and, indeed, by the chromophil system generally. This influence is of the nature of a stimulation due to epinephrin. Marine and others regard this suprarenal influence as the main factor in the hyperplasia of Graves' disease. Lastly, infective and toxic diseases generally

stimulate the thyroid to increased activity and there are those such as McCarrison who regard endemic goitre as essentially an organismal condition primarily of the alimentary tract.

Whether or not permanent alteration in the thyroid structure results from hyperplasia will depend upon the duration of the stimulus. If that is removed the gland will return to the normal in a few days or, at most, weeks. Reversion of the active gland to the resting stage is accompanied by a diminution in the size of the gland cells—they return to their cubical form. At the same time the alveoli fill up with colloid material. Owing to the foldings which developed in the alveolar wall during the active stage the tendency will be for the alveoli on being again distended with colloid, to be permanently larger than before except in so far as new and smaller ones have formed At the same time the vascularity of the organ will decrease and some of the newly formed gland tissue and stroma may be absorbed. But the tendency will be for a gland which has once undergone this hyperplasia to remain permanently somewhat enlarged particularly if the stimulus has been of long duration or repeatedly applied. The great factor which brings back the gland to the resting state is the establishment of iodine equilibrium.

Something must be said about the minute structure of the gland before going on to the discussion of the changes which it undergoes in goitrous enlargement. Two types of cells are distinguished among those lining the alveoli: (1) the so-called *chief cells* which contain large numbers of granules, and (2) the *colloid cells* which contain, in addition to the granules, minute vacuoles of colloid-like material. The granules present in all the cells are known as mitochondria or Altmann's granules. They are lipoid in nature and stain brown with osmic acid. They are rare in the foetus and increase with age. They also increase in number with increased glandular activity but their number bears no relation to the pharmacological activity, *i.e.*, to the amount of active iodo-thyreo-globulin being produced. In contrast to what is found in the case of other granular gland cells, the mitochondria of the thyroid are most numerous between the nucleus and the free margin of the cell. Further, what is known as the Golgi apparatus —a protoplasmic reticulum—is also present in the majority of cells between the nucleus and the lumen. Only in one cell in 500, it is stated, does this reticulum occupy the usual position between the nucleus and the basement membrane. This, in the case of a majority of the thyroid cells, indicates what has been called reversed polarity. That is to say, most of them secrete not towards the alveolus but towards the blood. Secretion towards the lumen only comes into play when thyroid material is being produced in excess of the body needs, *i.e.*, is being stored. This reversed polarity is observed only in the thyroid although the gaseous interchange in two directions in the lung alveoli may be regarded as somewhat analogous.

In the stroma of the thyroid there have been observed groups of undeveloped thyroid cells. These are regarded by Wölffler as being embryonic rests which are capable of forming new thyroid tissue should the necessity for it arise and which it is generally admitted give origin to the so-called adenomata so characteristic of one type of goitrous enlargement.

Here a word must be said about regeneration of thyroid gland tissue. All glands possess the power to regenerate in greater or less degree after partial destruction or removal. This is very marked in the case of the liver as for example following the destruction of acute atrophy. Given time, *i.e.*, if the patient lives, the liver can regenerate itself from its isolated remnants almost completely. The thyroid also possesses this regenerative capacity in marked degree. Marine states that in the dog if three-fourths of the gland are removed regeneration will take place from the remaining fourth. It is interesting to note that the administration of iodine will prevent such regeneration. Regeneration, as also hypertrophy and hyperplasia, will not occur until the iodine store falls below a certain level (0.1 mgm. per gm. dried gland).

Following destruction and degeneration of the gland as in thyroiditis, regenerative areas are often met with. Such nodules of regeneration are extremely difficult to distinguish from the so-called adenomata. Indeed, it is questionable whether most of the adenomata which form so marked a feature of a certain type of goitre are not in reality nodular areas of regeneration.

The thyroid is rich in vessels, both blood and lymphatic. It is usually stated that the iodine-containing hormone passes from the alveoli into the former and not into the latter. The gland is also richly supplied with nerves all of which apparently belong to the sympathetic system. They are distributed to the vessels and to the base of the gland cells. There is, however, no

XUM

direct evidence that secretion is under nerve control. A point against such control is that thyroid tissue transplanted to another part of the body of an animal responds to stimuli in the same way as does the original gland.

We may define goitre as a more or less permanent enlargement of the thyroid gland. Such a definition would, of course, exclude the temporary enlargements of puberty and pregnancy. This enlargement may be brought about by stimulation in some of the ways cited, but two types stand out above the others, (1) so-called endemic goitre which is met with in limestone areas and is fairly generally admitted as being due to iodine deficiency, (2) exophthalmic goitre, a condition due to over stimulation of the gland by factors as yet imperfectly understood but which many regard as intimately associated with the functions of the suprarenals. It is with the former condition, one which is peculiarly interesting to all inhabitants of the Great Lakes Basin, that we are especially concerned with to-day.

At one time many types of goitre were distinguished according to the morbid anatomical changes found, for example parenchymatous, cystic, interstitial, calcareous, etc. It is now generally admitted that these so-called varieties do not develop independently of one another but represent stages or metamorphoses through which all goitres may pass. Very often several of these stages or metamorphoses are present in one and the same case. So constantly are these types, stages, and alterations intermixed that classification becomes extremely difficult. Three types, however, stand out fairly clearly:

(1) Parenchymatous goitre representing the stage of active stimulation when colloid is deficient or absent, most typically present in the exophthalmic goitre,

(2) Colloid goitre corresponding to the resting stage to which the gland returns on the removal of the stimulation,

(3) Adenomatous goitre in which tumour-like masses of regenerating or neoplastic tissue occur.

(4) True tumour formation either simple or malignant.

The types most usually met with either as sporadic or endemic goitre are the colloid and the adenomatous. At the same time it is not unusual to meet with areas of parenchymatous change in these two common types.

Superadded upon the two common varieties are certain complications of which cyst formation, haemorrhage, necrosis, and calcification are commonest.

The tumour formations require some further attention. As stated, simple adenomata very commonly complicate the colloid goitre. They are called adenomata, but it is exceedingly difficult to distinguish them from nodular hyperplasia and areas of regeneration which also occur in goitre. Two types of these tumours are distinguished, viz., (1) the foetal adenoma, which as its name indicates, resembles the foetal thyroid in appearance, the gland acini being minute, containing little or no colloid and the stroma small in amount (2) the colloid adenoma which resembles the resting gland in structure and is differentiated from it only by the fact that it is intruding itself and pressing aside the surrounding gland tissue. These tumours are regarded as originating from the thyroid rests, already mentioned, which exist in the stroma of the normal gland, but they may arise from any thyroid gland cell. As an explanation of the variation in type it is suggested that the rests have reached different stages of development. One which is still in an embryonic stage will, if stimulated to proliferation, develop into a foetal adenoma, whereas one which has progressed further will produce the colloid type. It is interesting that the foetal type may or may not be able to take up iodine as does the normal thyroid gland cell, whereas the colloid behaves in this respect exactly as does the normal thyroid tissue. On the other hand, malignant adenomata do not take up iodine at all. Little need be said about these last as they occupy a position by themselves. They may form solid masses of cells (spheroidal cell carcinoma) or they may develop acini. Some are relatively simple in that they do not appear to metastasise readily, while others produce secondary deposits sometimes with a marked affinity for bones.

The complications of goitres require more than a word of notice because the size of most goitres is, in no small part, due to cyst formation and haemorrhage. Haemorrhage is the commonest of these complications and may be due to injury or rise in blood pressure, as from sudden exertion, in the vessels of the delicate stroma. The part which trauma plays is emphasized by the frequent occurrence of haemorrhage in the thyroids of dogs. The bleeding takes place both into acini and into stroma. In the former case sudden enlargement due to formation of a

blood cyst may follow. The blood in such a situation disintegrates and is in part taken up by phagocytes. Blood in the stroma leads to a deposit of cholesterine and is followed by fibrosis and often by calcification. Calcareous deposit is usually preceded by a hyaline change in the connective tissue. It occurs in areas of sclerosis often following interstitial haemorrhage and may end in true bone formation. It also occurs in the walls of small vessels in any area imperfectly supplied with blood, or in the media of the larger arteries as a result of senile change. This latter form of calcification is known by the name of Mönckeberg. It is often an accompaniment, it may be actually the cause, of the senile atrophy associated with some cases of myxoedema.

Cyst formation is very common in goitre. Marine would restrict the use of the term to haemorrhagic and necrotic cysts, excluding mere distention of alveoli. This, however, is an arbitrary limitation of the term cyst. The following classification may be given: (1) Cysts due to overdistention of alveoli with colloid. What this is due to is not very clear. It may be caused by deficient absorption or excessive secretion into the alveoli. In many instances, as is suggested above, it is due to the formation of large alveoli during an active stage of proliferation. These, when the colloid returns, become passively distended to the limits of their capacity, forming bladder-like spaces. (2) Cysts due to haemorrhage and subsequent degenerative changes. (3) Cysts due to necrosis. These last may follow haemorrhage or they may be due to interference with blood supply as in the case particularly of an adenomatous nodule. Such a nodule has one or more vessels of supply which tend as the tumour enlarges to become unequal to the demand of the growing tissue. Moreover, the pressure of the enlarging nodule interferes both with the intake and the outlet of blood leading to anaemic necrosis, to engorgement and haemorrhage.

Summing up the situation as regards the mode of origin and history of the enlarged thyroid of the goitrous district the following statements can be made: During periods of stimulation of which the main cause is deficient iodine supply, other causes being alterations of diet, pregnancy, puberty, infective diseases, etc., the gland undergoes hyperplasia. With the passing of these stimuli, the gland resumes the resting state, the colloid returning and distending the now considerably enlarged alveoli. In this way the usual type of colloid goitre is produced. But the gland is not left at rest. The stimuli from different causes are repeated, producing periods of activity followed again by periods of rest. Under this more or less constant state of evolution and involution, in a way that we do not as yet understand, simple tumour formations rise. Thus is produced the adenomatous type of goitre. Areas of nodular hyperplasia and regeneration are produced under like circumstances, but so similar are these to the simple tumour formations of the thyroid that it is practically impossible to differentiate them. At any time in the history of such a gland, from injury or sudden increase in blood pressure, haemorrhage may take place to be followed by cyst formation, fibrous overgrowth, calcification, and necrosis. Through glandular exhaustion, inflammation, or arterial disease, fibrous atrophy of gland tissue may supervene, and myxoedema or an approximation thereto, result.

Pregnancy After Interposition of the Uterus.—Although a successful procedure for prolapse, interposition of the uterus presents a decided hazard to future pregnancy, as is shown by the cases reported by Irving F. Stein, Chicago. Because of the fixation of the anterior wall and fundus of the uterus, only the posterior wall is available for development during pregnancy, and at term the cervical canal is perpendicular to the axis of the inlet. Thus, the pelvic inlet is obstructed by the undeveloped anterior wall of the uterus, and labor results in a tendency to flatten the cervical canal from side to side instead of obliterating it from above downward. With the cervix in this position, rendering spontaneous labor impossible, and the anterior uterine wall fixed to the anterior vagina there is only one rational procedure for the treatment of advanced pregnancy, namely, abdominal hysterotomy.—*Jour. A. M. A.*, Aug. 11, 1923.

XUM

SOME UNUSUAL FEEDING CASES

ALTON GOLDBLOOM, M.D.

Montreal

INFANT feeding in difficult cases is still more an art than a science. Despite the many and varied theories with regard to the etiology of malnutrition, despite the fact that each element of cow's milk has in its turn stood the brunt of the blame for all the digestive disorders in infancy and despite the existence of a copious literature explaining in detail why and how each of these elements blamed is responsible for malnutrition in infancy, the fact remains that we are still largely in the dark as regards the main issue, although here and there a beam of light has been thrown on isolated phases of the problem. Notwithstanding the work of recent years, we have not acquired sufficient knowledge of the pathology of digestion of infancy to adequately classify our cases of athrepsy in such a manner as to give us in each case a key to the solution of each particular problem. We are still, of necessity empirical, and it is the degree in which this empiricism is practiced successfully that constitutes the art of feeding in difficult cases.

Such instances of difficult feeding problems are by no means uncommon in the routine work of most paediatrists. In fact, as paediatrists it is expected of us to have some knowledge and ability in the feeding of infants who fail to thrive on the ordinary formulae usually prescribed for artificially fed infants. There are instances, however, when unusual methods are required in order to bring a difficult case to a successful termination. Such unusual methods are frequently in direct opposition to orthodox methods of feeding in vogue, and often follow no definite set of rules. During the past three years I have had experience with a number of such instances, a few of which I wish to report in this communication.

Case I: Baby G. First seen at the age of three months. She was the first living child of healthy middle-aged parents, there had been a number of still-births and miscarriages due to uterine malformation. The baby weighed 9¼ pounds at birth, was nursed for about a few weeks and weaned. She was put on a simple formula of milk, barley water, and dextri maltose. Progress was very slow indeed, despite the fact that the food fed was theoretically sufficient for its needs. Constipation was very obstinate. For this, cream was added to the formula, ounce by ounce to a total of five ounces per day, without result. At three months the child weighed ten pounds nine ounces, one pound and five ounces above its birth weight. She was pale, long, and thin, had drawn features, she had a large abdomen, was extremely cross, slept very poorly at night, the weight had not varied more than one ounce in six weeks. The stools were absolutely dry, were extremely foul smelling, and never soiled the diaper. All this, in spite of the fact that the child was receiving a half teaspoonful of milk of magnesia and ten drops of castoria in each of seven bottles. In order to produce an action of the bowels at all, the mother, who had been a trained nurse, had to insert a finger in the rectum and break up the hard masses of faeces. Enemas were given frequently, castor oil occasionally. There was no vomiting. The food, when the child was first seen, consisted of cream, five ounces; milk, fifteen ounces; sodium citrate, four grains, oatmeal water, twelve ounces; and dextri maltrose, three tablespoonfuls, together with milk of magnesia and castoria already mentioned.

A diagnosis of congenital dilatation of the colon had been made, the parents had been prepared for an operation and the child for a stormy career.

The physical examination failed to reveal any definite evidences of a megacolon, nor of any other definitely pathological condition. It seemed to me that here was a typical instance where a malt soup mixture was indicated. The child was over three months of age, was constipated, there was no vomiting and the weight was stationary. These have always been accepted as the indications for malt soup mixtures. Accordingly, the milk of magnesia and castoria were omitted, the cream was stopped, and the following simple malt soup mixture prescribed:

Whole milk.....	15 ounces	
Water.....	15 "	
Flour.....	3 level tablespoons	
Malt soup.....	2½ "	" (4½oz.)—7 feedings 3 hour interval.

The child was contented on this mixture and at the end of twenty-four hours had her first spontaneous bowel action, the stool being soft, smooth and brown. The disposition changed for the better, the child began to sleep well; the constipation was completely cured; and at the end of one week, on the above formula, a gain in weight of thirteen ounces was recorded. Progress was rapid from then on, the child weighed seventeen pounds at six months and twenty-four pounds at a year.

Comment.—This case served to illustrate two points; first, what can be done with malt soup mixtures when the cases are carefully selected, and secondly, that the addition of cream to the food of a constipated child does not always have a laxative effect. My own experience in this connection has always been similar to the result in this particular case, namely, that the effect of cream is constipating rather than laxative.

Case II: Frank F., age 4 months. First child of healthy parents. Weight at birth was 7.4. He was nursed for three months but did not thrive well. When he was weaned, he weighed nine pounds, having gained about two pounds since birth. When first seen one month later, he weighed nine pounds, four ounces. At that time he was being given the following formula:

Whole milk.....	14 ounces
Oatmeal gruel.....	14 "
Dextri maltose.....	3 level tablespoonfuls
Four ounces.....	6 feedings—3 hour interval

The caloric value of this mixture was three hundred and ninety or forty-two calories per pound.

The physical examination was negative except, of course, that the child was thin. The Von Pirquet was negative. The difficulty in this case was that the child never took more than two to three ounces of its food. The formula was left unchanged but the interval was lengthened to four hours with instructions to the mother to remove what was left in the bottle at the end of twenty minutes. This procedure had no effect whatever upon the appetite of the child, he continued to take never more than three ounces of food, was never eager for his bottle, and at no time evidenced any signs of hunger. This was considered extremely unusual in a child who had no acute or chronic disease. Still, several very careful physical examinations, including repeated examinations of the urine for pyuria, failed to reveal any evidences whatever of disease. After three weeks of observation and adjustment of the formula given above, practically no progress was made—the child still refused to take more than three ounces of food at a time, and when attempts were made to shorten the interval, he began to refuse some of his feedings entirely. The mother was asked to keep a record of the total daily intake of the child for a period of three days. She reported that the average intake was fourteen ounces per day. The baby was now five months old and weighed nine pounds, fourteen ounces.

It seemed to me that the solution of this difficult and unusual problem lay in giving the child in the fourteen ounces which we knew he would take, sufficient food to cover his growth requirements. Therefore, it was thought advisable to give the following food: eight tablespoonfuls of whole milk powder and three tablespoonfuls of lactose were suspended in fourteen ounces of barley water and fed to the child during the course of the day at four hourly intervals. This allowed a total of four hundred and sixty calories or about forty-five calories per pound. Water was allowed *ad lib.* between feedings. The result was a gain of seven ounces at the end of the first week on this treatment. Whenever the child showed an inclination for more food, which he did very soon afterwards, water was added to the mixture. Soon he was taking eighteen ounces per day—but for three months refused to take more. The strength of the mixture was increased in accordance with his needs. Progress was steady, interrupted only for one week when the child contracted lobar pneumonia. He weighed twenty-one pounds at eleven months and twenty-three pounds at one year.

Comment.—This case is unusual from two stand points; first, because of the rarity of lack of appetite in an infant showing no signs of acute or chronic disease, and secondly, because of the method used in making the child gain in weight. The first formula fed contained twenty-nine calories per ounce, nearly half again as rich as undiluted cow's milk. Yet the child did well on this mixture and on looking back on the case, it is difficult to see how the child could have been made to thrive on anything else.

Case III: Baby H., age 5 months. Was very similar with regard to the lack of appetite. She had been weaned at ten weeks of age when she weighed exactly ten pounds. At five months she weighed eleven pounds, thirteen ounces. Her food, then, consisted of whole milk, twenty ounces, water, sixteen ounces, malt sugar, six

XUM

tablespoonfuls, divided into six, four hourly feedings. This gave a total of six hundred and forty calories or about fifty-three calories per pound. Here too, the weight was stationary because the child never took more than four ounces of food and many times refused her bottle entirely. Profiting by the experience of the case previously reported, a similar formula was suggested, but this child being very fastidious in her tastes, refused, and could not be made to take dry milk in any form. The same fate met any attempts to give fermented milk with corn syrup, accordingly the child was allowed twenty ounces of whole milk per day, to which was added six tablespoonfuls of malt sugar. This she took well and immediately began to thrive. Gain in weight has been uninterrupted ever since. She is just one year old and weighs nineteen pounds.

Comment.—Here too, we have a case similar to the last one treated successfully along the same lines. It seems to indicate that it does not really matter how concentrated a mixture is fed to a child so long as the requirements of the child are adequately covered. This point will bear further and more detailed investigation.

Case IV: Baby C., age 3½ months. Third child of healthy parents; the other children are well. Weight at birth was 7½ pounds; present weight at 3½ months is only eight pounds. He was nursed for three weeks and weaned at the order of the attending physician because of a failing milk supply. At the age of five weeks he began to vomit after every feeding. The vomiting was never explosive but occurred in mouthfuls, and in small quantities, for a long time after each feeding. Nothing in the history of the vomiting suggested the possibility of pyloric stenosis. The vomiting rather suggested a mild type of rumination, although the characteristic noises and working of the jaw were absent. The bowels were constipated; he was sleepless and always fretful. Up to the age of 2½ months he had been fed on a variety of mixtures including modified milk and numerous proprietary foods. For one month before I saw him first he was fed by a wet nurse, but with no effect on the vomiting nor upon his general condition. He had been nursed at the breast every three hours at first; later every two hours. At this time he was only one half pound in advance of his birth weight. On examination he was a thin, typically marantic infant, extremely unhappy; he had practically no subcutaneous fat. Repeated examinations for gastric peristalsis gave negative results, nor was any evidence of the presence of a pyloric tumour ever found. This was not, then, a case of pyloric stenosis, nor of pyloric spasm, nor was the child very definitely a ruminator. It seemed that this was a typical case for thick cereal feeding. And since there was a wet nurse it seemed reasonable to make the gruel with the nurse's milk. The following formula was prescribed:

Breast milk	20 ounces
Farina	3 level tablespoonfuls
Cane Sugar	1 " "

Cooked two hours in a double boiler.

This made a very thick mixture, which was divided into five equal parts, one part to be fed every four hours with a spoon. Atropine sulphate, one one-thousandth of a grain was given a few minutes before each feeding.

The mother reported only a very small amount of vomiting at the end of twenty-four hours on this food. At the end of forty-eight hours the vomiting had ceased entirely. The child was taking the food well and was having spontaneous bowel movements, whereas previously he always required both laxatives and enemas. The first week on this treatment showed a gain of three-quarters of a pound. At the end of six weeks the child's weight is now thirteen pounds, a total gain of five pounds to date. Any attempts to return to liquid food are successful only for the first day or two after which the vomiting is resumed almost with the same degree of intensity as before the beginning of this treatment.

Comment.—This is an excellent example of the effect of thick cereal feeding in a selected case. In this instance there was no definite evidence of stenosis, spasm, or rumination. It might be argued that this was a case of mild pyloric stenosis and such an argument cannot be entirely refuted. Still, granting this to be true, thick cereal is indeed indicated, under such circumstances.

At the end of three weeks on this food several samples of stool were carefully examined for the presence of undigested starch, with negative results.

Case V: Kenneth S., age 2 years; first child of healthy parents. Weighed nine pounds at birth; was nursed for four months and weaned on the advice of the physician, on account of excessive crying. He did well, however, on a whole milk mixture and weighed twenty-eight

pounds at the age of eighteen months; his best weight. For the past six months he had been having prolonged attacks of diarrhoea which took his weight down to twenty pounds. The stools were copious and loose; the appetite was very poor; the diet consisted of three meals a day, rather rich in carbohydrates, but was fairly well balanced otherwise. On examination, the child presented all the features of chronic intestinal indigestion. He was thin, his features were drawn, he had a large, very prominent abdomen. The child was considered a case of coeliac disease and treated as such, namely, he was put on a pint of fat-free lactic acid milk per day and given a diet rather rich in proteins and poor in fat and carbohydrates. No improvement was made on this treatment during a period of six months. While this was not at all unexpected in a case of coeliac disease, it was observed that the stools constantly contained large quantities of undigested milk curd. The quantity of milk was accordingly reduced to minimum amounts, and it was noticed that however small the quantity of milk allowed, the curd continued to appear in the stools. This suggested an inability on the part of the child to handle milk and, therefore, a milk-free diet, well balanced, was prescribed with the astounding result of an immediate improvement in the general condition of the child, in his disposition and in his weight. For the past eighteen months this child has not received one drop of milk in his diet.* He has gained over eight pounds. He is doing remarkably well. Any attempt, even to-date, to include milk custards, milk puddings, or junket in his diet invariably causes a looseness of the bowels and the re-appearance of curds in his stools.

Comment.—This case is not strictly speaking one of infant feeding. Still it presents a problem which is rather unusual and for this reason only is included in this group. The condition was probably one of indigestion rather than allergy. Several skin tests made with cow's milk protein were negative. Moreover, the child did well on cow's milk from the age of four months to the age of eighteen months.

A variety of difficult and unusual problems in the feeding of infants have been presented. They serve to illustrate that fixed rules cannot be followed in their solution, but that each case must be treated entirely upon its own merits and in some instances not only upon original lines but by methods which frequently diverge considerably from accepted forms.

*Attempts were made in this case to add calcium caseinate in order to supply the calcium deficiency of a milk free diet. As this too led to digestive upsets, the deficiency was overcome by the addition of small doses of calcium chloride.

Insulin in Tissues Other than the Pancreas.—C. H. Best and D. A. Scott, Toronto, have been able to prepare active extracts from the submaxillary thymus and thyroid glands and from liver, spleen and muscle tissue. These extracts have been repeatedly tested on normal rabbits and have consistently produced a marked lowering of the blood sugar of these animals. A large dose produces typical insulin convulsions in the rabbits. The convulsions are alleviated by the administration of dextrose. The number of units obtainable from 1 kg. of thymus or submaxillary gland tissue exceeds that originally obtained from pancreatic tissue. This yield is, however, only a small fraction of that obtained when pancreatic tissue is treated by the present procedure. The authors have secured results which tend to indicate that this substance, which we believe to be insulin, is excreted in somewhat greater amounts by pregnant women than by normal men. Insulin is present in every tissue they have investigated.—*Jour. A. M. A.*, Aug. 4, 1923.

A Possible Mistake in the Diagnosis of Gonococcal Infection of the Kidney.—The case reported by Charles H. de T. Shivers, Atlantic City, N. J., shows how easily micrococcus caterrhalis infection of the kidneys could have been mistaken for gonorrhoea had not a careful bacteriologic study been made. The morphology of the gonococcus and of *Micrococcus catarrhalis* are practically identical. No one can safely differentiate them by morphology and staining.—*Jour. A. M. A.*, May 12, 1923.

XUM

ADDRESS IN SURGERY*

L. J. Austin, M.B., F.R.C.S. (*Eng.*)

Professor of Clinical Surgery, Queen's University, Kingston

I FIND it is usual in the presentation of this address to take up some definite subject of special interest or refer to the more prominent discoveries and advances of the last year. The range of subjects under the head of surgery is so vast that there is ample scope for choice, the very size making any selection only the more difficult. I have myself chosen to present to you to-day some observations in the education and training of a surgeon. I feel that no excuse is needed for the choice I have made, as it is my own work at Queen's University to lay the foundation stones for, I hope, many brilliant and successful surgical careers.

Examinations.—I will commence with the consideration of a most unpleasant part of all educational systems—I mean examinations. The system is admittedly very far from perfect as a test not only in medical subjects but in all branches of education, but the human brain has not yet managed to evolve any method by which examinations can be eliminated. It is said that the Chinese first introduced the system for Civil Service appointments, and thereby invented an aristocracy of tradition and learning however narrow it may have been. It is not my purpose here to trace in any great detail the gradual rise of surgeons and surgical art through the tortuous paths of the barbers, and in spite of the bitter hostility of the physicians through many ages, or to follow the rise in dignity and position of our craft which is so closely associated with the development and increasing importance of military urgency.

After the fall of the Roman Empire medical and surgical knowledge retired to Constantinople, and as the Eastern Roman Empire grew more and more impotent, learning was mainly absorbed and increased by the Arabians and spread with the rise of Mohammedanism throughout Eastern Europe, Asia, North Africa, and Spain. This medical knowledge which was at a much higher level than anywhere in Europe gradually filtered back again with the Crusades, and by the trading established across the Mediterranean. A very little is known about the actual surgery of the Crusades and the famous military medical orders of the Temple and the Knights of St. John soon fell away from the original intent of nursing and aid to the pilgrims and became much more military than medical and exercised a political and financial power which was to lead to their ultimate downfall. Towards the end of the period of the Crusades and marking the very earliest period of the Renaissance there arose in Sicily a truly remarkable and liberal minded man, Frederick II, Emperor of the Holy Roman Empire: Frederick, *stupor mundi!* the wonder of the world!!

He was a great patron of the liberal arts and sciences and at the University of Salerno established a medical school and instituted the system of examinations for diplomas. Frederick's edict required that candidates for license to practice must be properly examined in public by the Masters of Salerno, the license being issued by the Emperor himself or his representative. Failure to comply with the statute by unlicensed practitioners was made punishable by a year's imprisonment and forfeiture of property. The examinations were based upon the genuine books of Galen, Avicenna and Hippocrates and before taking it the candidate was required to have studied logic for three years, medicine for five years, and have practised for one year under some experienced physician. The candidate in surgery had also to give evidence that he had studied the art for at least an extra year, in particular, human anatomy, "without which," as the statute states, "no incision can be safely made, nor any fracture treated." The physician was required to treat the poor for nothing, to visit his patients twice a day, or once at night, to avoid collusion with apothecaries and to inform upon them if they adulterated or substituted drugs. Office fees were fixed at thirty-five cents, out of town visits three dollars, while operations varied from $20.00 to $200.00, and in cases of wealthy patients a life annuity was paid the operator as well. When we consider that money

*Read at the Annual Meeting, Ontario Medical Association, Windsor, June, 1923.

was worth fifteen to twenty times as much in those days as it is at present, our ancient brethren seem to have been paid reasonably well. The sale of poisons, magic potions, and aphrodisiacs was punishable by death if any person lost his life thereby: food, drugs, and apothecaries' mixtures were examined at stated intervals by inspectors. Such regulations were adopted by other States, but were never carried out: the world was not ready for such a sweeping reform, and we have not yet reached a position as outlined above. The surgeon does not receive an annuity as well as a fee for his work: the irregular practitioner is almost encouraged instead of being thrust into prison: the trafficker in opium and cocaine would, I feel sure, be more seriously deterred from his trade if a life penalty followed any disaster. We still have to maintain inspectors for food, and have trouble in establishing a standard of purity and strength for the drugs in common use.

The examinations held in those old days and carried on for many years in the great semi-monastic universities of Europe were held in public and were mainly oral: the written paper was a curse to come later. For several centuries, however, in spite of the universities, and in spite of many famous surgeons and anatomists, it must be admitted that surgery remained in a very degraded condition. In the words of William Clowes, himself a surgeon of repute, we can see from what lowly state we have originated, and how the practitioners of the art were recruited. He says of his fellows: "they are no better than runagates and vagabonds, shameless in countenance, lewd in disposition, brutish in judgment and understanding." In another place he complains that the art was mainly practised by "Tinkers, tooth-drawers, pedlars, oslers, carters, porters, horsegelders and horseleaches, idiots, applesquires, broom-men, bawds, witches, conjurers, soothsayers and sow-gelders, rogues, rat-catchers, runagates and proctors of spittle houses."

The art of surgery remained in the deplorable state until the middle of the eighteenth century when organization and the formation of colleges and guilds under Royal Charter rapidly occurred in the civilized countries of Europe, starting first in France under Louis XIV and in England about 1740. From this time onwards the principle of examinations has been well established and many attempts, most of them unsuccessful, made to compel all in the healing art to conform to the regular channels.

The Anglo-Saxon race has a peculiar tendency to cling to its old regulations and the whole of the evolution of law is built upon a slow modification of existing enactments. In no branch is this more clearly brought out than in the evolution of examinations and licensing bodies for medical and surgical practice. In the Old Country, in addition to the older and younger Universities, we have the various Royal Colleges of England, Scotland, and Ireland, acting as examiners and grantors of degrees, and at the same time various much less important bodies like the Society of Apothecaries still cling to their ancient rights and issue a few not very important diplomas. Any attempt to combine these various bodies and establish a more uniform and standard examination is at once met by all the powers of tradition and vested interest which immediately hold up any often much required reform. Here in Canada, as far as I am able to understand, the same process of evolution and regulation to meet existing conditions have drifted on until we have arrived at the present admitted duplication of examinations. Surely a university examination should be enough! Would it not be possible to combine the function of the provincial and Dominion examining boards to prevent reduplication. The ideal seems to me to effect such an amalgamation of the various provincial interests that a single examination of high standard conducted at the medical schools and universitites of the Dominion should carry a license to practice in the Dominion, and by cross registration in the various sections of the British Empire. To effect this it would be necessary to have outside examiners appointed to assist at each of the colleges and universities and representatives from the Dominion and, if necessary, the provincial authorities, to see that the standards are sufficiently high. The cross examining system is always used by the universities in England. For instance, when I took my Cambridge degree, only two of the eight examiners were appointed from the staff of the University. The General Medical Council of the United Kingdom is legally responsible to His Majesty's Government that the standard of examinations is kept at an adequate level and that body constantly sends representatives to draw up reports upon the efficiency of the various licensing bodies. I know full well and fully appreciate the difficulty of language and distance in this great Dominion, but even if this is insuperable over the whole of the country, could not a province like Ontario

XUM

make a start? I hope to see the day when the final examinations of Toronto, London and Queen's are held upon the same day, with the same standards—with cross examiners from each of the schools and with a completed university degree and license to practice all at once. As you all know the provincial authorities of Quebec already permit the graduates of McGill University to proceed to the provincial license without further test than their university degree examination conducted under supervision by the provincial authorities. So it can be done.

Curriculum.—The next aspect of medical education in this country to which I mean to refer is the tendency within recent years to lengthen the curriculum and thereby the number of years required for the medical student. I will here quote from the newspaper report of a speech by the Hon. Dr. A. E. Ross, delivered in the Dominion House on Friday, May 25th: "In our school system we have been dominated by the influence of the United States, and to-day the boy of poor parents is practically cut out from the technical courses. In my time a boy could take four years in medicine and graduate. In the past we have had some very, very, successful physicians as the result of that four years' training. During the four years the boy was able to go out and earn money to put him through his course. Personally, that was my experience. I had to put myself through college and earn the necessary money to do so. To-day, the course takes six or seven years. This is altogether due to the influence of the United States, to our trying to imitate their system. With the lengthened course the term has also been extended so that the boy has very little opportunity of earning his expenses, and consequently the boys of poor parents are practically excluded from these branches of study—all because of the influence of the United States over our school system.

"Then, too, we have come under the influence of the United States in the standardization of our hospitals. And what has it cost us? We have followed their advice under the Rockefeller Foundation and have built up hospitals according to their standardization. This has resulted in a very expensive system of hospitals, a system not at all intended for our use, a system where the poor man has to attend the public wards and take the doctors in those wards, and all simply to fulfil American ideas of standardization in hospitals."

Although all of us will not agree with the Hon. Dr. Ross that the length of the curriculum is entirely due to American influence we will all agree with the very serious financial aspect for the boy who desires a medical education. With the shortened summer recess and the very marked increase in the difficulty of getting remunerative work during the last two summers in this country, owing to the post-war depression, I have come across many cases of boys who are finding great difficulty in financing their last two years and are leaving for practice with a serious burden of debt to pay off, in many cases to their companions and even their landladies. I think we must admit that there is another factor at work in increasing the length of the curriculum beside the American standards, and that is, that the boys have got to drive into their heads every year and year by year just a little more knowledge to satisfy their examiners, and there is a physiological limit to the receptability of the human brain. Even in the comparatively few years during which I have been qualified, such discoveries as the causal organism of syphilis, the application of the bulk of serum therapy, practically the whole of the special subject of genito-urinary surgery, blood chemistry, etc., etc., have all developed and all are made subjects of examination for students. The limit has got to be set some day and that fairly soon as the subject advances, and some scheme will have to be worked out to make and qualify a medical practitioner, not actually dangerous to the public. I cannot, therefore, entirely agree with the Hon. Dr. Ross that the change from four years to six or seven years is due entirely to the American control, although this factor has an important bearing on the condition. Also, we must remember that a large number of our students and graduates are accepted as *internes* and not infrequently settle as practitioners in the neighbouring country, and that State may, therefore, feel entitled to a say in the education of its absorbed citizens. While this is so, I cannot see that the organized profession in the Dominion could not settle its own affairs and set its own standards without accepting money from the States, which money is accompanied by a certain amount of dictation of policy.

The length of the curriculum makes us ask ourselves whether there is not an undue prominence placed on the preliminary subjects as opposed to the more definitely strictly medical work. There has been a tendency to add more and more courses to the whole, and while time has been added by years also, certain other parts have suffered from cuts in their allotment.

Let us consider some of these subjects separately:

(A) *Anatomy.*—I find, on the whole, that this truly important subject has not as much time devoted to it in this country as in England. More especially not nearly so much importance is attached to anatomy in the final examination as across the water. Personally, I feel that anatomy is all essential for a man who is training for a surgeon, and that it is incumbent in every young surgeon who is fortunate enough to be settled near a school of anatomy to obtain a demonstrationship and keep it up by teaching. The teaching of anatomy has passed away from the surgeon in practice and has become a special academic subject, with the result that a quantity of comparatively useless knowledge is demanded of the student and the training is scientific and bears little relation to the anatomical problems of practice in fractures, sepsis and general operating. Anatomy as I have said has suffered by the insistence of its rivals for more time and I feel strongly that any further cut in anatomy is positively dangerous.

(B) *Physiology.*—Also a fundamental subject, seems to have got a bit off the lines and the student is only too ready to throw away his physiology note book when he reaches the wards. Perhaps here, too, the subject is too academic and not sufficient trouble is taken to point out the intimate bearing of the observed phenomena upon disease.

(C) *Pharmacology.*—As an allied subject is comparatively new as a separate course and requires much time and application for its adequate study. Although much scientific medicine is based on pharmacological research, the insistence of this subject for a regular course to students has many opponents.

(D) *Chemistry.*—Is unquestionably a fundamental subject but I am certain that too much time and labour is spent upon it. Certainly the average medical student when he reaches the time for graduation, and more certainly still, the average practitioner, and most surgeons, remember but little and care less about the chemistry of the youth. It is stated that it is a valuable training like Latin and algebra and all the other things we automatically forget. Perhaps so, but can we afford a year or a year and a half in learning a subject just to forget it? Perhaps another year at anatomy would be a very good training and might leave behind it some knowledge of future use to the man who has to learn it.

(E) *Biological Chemistry.*—Is of immense importance for the laboratory worker and is at present, as we all know, offering on the research side a wide field of accomplished results and opens up a vast range of hope for the future. I suppose I should be ashamed to say that although a surgeon I cannot remember the formula for uric acid and if I want a blood sugar reaction done I send it to the man in the laboratory who has made a special study of this subject. So do you!

(F) *Physics.*—Here again we have a subject that is necessary for the surgeon but only slightly if we are honest with ourselves. It mainly applies to the X-ray apparatus and care of small electrical outfits like the cystoscope and how to start a car on a wet night in mud forty miles from home. I certainly feel that enough physics could be taught at school before entry into the university.

(G) *Pathology.*—Here is, indeed, a subject that ranks with anatomy in importance for the surgeon. It is mainly by pathology, histology, and morbid anatomy that we can form a just estimate of the disease it is our duty to combat. Viewed in the light of our teaching, "How do we die?" It is a common taunt and accusation by the physical expert and the nature healer, the Christian Scientist, and all the faddists, that medical and surgical diagnosis is often incorrect and proved incorrect in the post-mortem room, the temple of truth. Alas it is so, but if we, with our special training in morbid anatomy are liable to gross error, what about the nature healer and other irregulars. They have no chance of learning the cause and the effect—no man should be allowed to pose as a healer without a special course in post-mortem work that he might be instructed in that most important of all human studies, a knowledge of how we die. An adequate appreciation of the causes of death is the only possible training for a man whose main function is to combat that dread enemy.

You will thus see from these few observations, that, in my opinion, the strictly medical subjects have suffered by the competition of the more scientific and academic aspects of medical education. I should like to see more responsibility for these thrown back on the schools, and the medical curriculum reduced in the universities, thus giving more time for post-graduate instruction and the evolution of a system for training specialists in the various branches of medical and surgical art.

XUM

SOME RESULTS OF RADIUM TREATMENT IN SARCOMA*

W. H. B. Aikins, M.D.

Toronto

THE results of treating sarcoma are not uniform. Surgical procedure is very often closely followed by recurrences, and metastases are the rule rather than the exception. The results in the treatment of certain cases of sarcoma with radium, however, have been so successful as to warrant a report, and I shall give details of certain of these later in this paper.

The effect of the use of radium on sarcoma cells histologically was investigated by an associate of the writer in 1913. A myeloid sarcoma of the tibia which formed a secondary deposit in the groin was diagnosed microscopically by biopsy, and was then submitted to a heavy radiation. Ten days later tissue was removed for examination. The large cells of the growth under the influence of the rays had changed to smaller connective tissue cells and spindle cells. The cells showed necrosis and necrobiosis. The connective tissue cells had been mobilized and the leucocytic infiltration was most intense.

Dominici describes the changes which take place after radium treatment of a very vascular myeloid sarcoma. He considers that the malignant cells are not only destroyed by the action of the rays and replaced by fibrous tissue, but that the sarcoma cells themselves were converted into cells indistinguishable from normal connective tissue. The protoplasm of the giant and sarcoma cells became replaced by connective tissue fibres which, Dominici believed, arose from the alteration of the protoplasm itself. The lumen of the blood vessels became smaller so that they appeared like capillaries lying in the midst of fibrous tissue. It seemed that the malignant sarcoma cells were transformed into fibrous cells. The fibroma-like structure remained stationary or became smaller showing no tendency to increase as in ordinary fibromata. The arrangement of the connective tissue fibres was remarkably regular.

In the treatment of sarcoma it is necessary to avoid, if at all possible, any breaking of the investing skin, for, if such should occur, it involves the possibility of haemorrhage and septic infection. For this reason, in most of the cases subsequently cited (except where mention is made to the contrary) there has been no pathological examination of tissue, but diagnosis has been made entirely on clinical evidence. For deep seated growths I make use of the gamma rays of radium, employing flat, heavily screened applicators over the mass, the dose varying in intensity in proportion to the extent and location of the lesion. In superficial sarcoma, however, beta rays are more satisfactory. Tubes and flat applicators are used in such cases, as I consider them superior to needles.

I have not had encouraging results with lymphosarcoma. This condition, however, bears a very close resemblance to lymphogranuloma, and we have found that the latter disease responds most favourably to radium rays. It is possible, therefore, that diagnosis may in some cases lie between these two, and our good results in lymphogranuloma may have been really cases of lymphosarcoma, and *vice versa*.

Cases of osteosarcoma are generally very unsatisfactory in their response to radium, with certain striking exceptions. For example, sarcoma of the palate has responded very satisfactorily in many instances. Epulis, also, and myeloid sarcoma of the bone, are most suitable for radium treatment. I treated one case of epulis in April, 1920, and there has been no recurrence. Another patient came to me in April, 1919. She had been operated on eighteen months before, and the condition had recurred three months later. Radium was applied in April, 1919, and again in May of the same year. In November, 1922, over three years later, there was still no evidence of the disease. A third patient came to me in November, 1922, for an epulis between the lower incisors. A pathological report on the tissue showed it to be a reticulated adamantinoma. She had had the condition operated upon some years previously. Radium was applied in November and there has been no return up to the present.

Another very interesting case of osteosarcoma

*Read before the Annual Meeting of the Ontario Medical Association, held at Windsor, June 1st, 1923.

is that of Mrs. P., aged 43, who had an osteosarcoma involving the right temple. It first appeared in June, 1914, and she reported to me in December of the same year. There were no eye symptoms, and the condition caused no pain, except in stooping. There was distinct bulging of the right temple over an area about two inches in diameter. The temple was radiated with well screened radium plaques at two month intervals for a year, once in the following year (1916) and twice in 1917. In November, 1922, she reported to me, and there was no appearance of disease, the condition having remained clinically cured for five years.

One of the most unsatisfactory types of sarcoma in its response to treatment is the melanotic variety. The local lesion may be entirely cleared up, but the prognosis in almost every case is not good, as metastases occur practically inevitably. Radium, however, is often able to hold the disease in check for some time. I shall report four cases of this condition, three of which resulted fatally. Mrs. C. came to me in September, 1910, for treatment of a small black nodule on the left cheek. Treatment was given in September, October, and November of that year, after which time the lesion seemed quite healed, and the patient did not return. She died in August, 1912, after metastases had developed in both groins. A second case, Dr. R., presented a pigmented mole on the right side of the abdomen in April, 1917. The pigmentation had been present for years, but had begun to spread. Radium was applied and the lesion healed completely. One year later a development appeared near the site of the original lesion which was removed surgically. Very soon after a further recurrence was removed surgically. Later a gland in the groin was removed. In January, 1920, a recurrence in the abdominal tissue was removed surgically. Further developments followed rapidly, and the patient died in May, 1920. A third case which resulted in an equally unfortunate manner was that of Mrs. W., aged 36, who had a mole on the back removed in 1920. It recurred and was operated on a second time in the fall of 1921. In April, 1922, she noticed a mass in the left axilla about one inch in diameter, also a small node in the gland on the right side of the neck. She came to me in June, 1922, and radium was applied. She reported at monthly intervals for three months. Each time there were new nodular developments. In January, 1923, she died. These three cases show the usual course taken by melanotic sarcoma. An encouraging case, however, is that of Mrs. R., who came to me in June, 1914, with a small dark spot on the left cheek. She had had it excised two weeks previously, pathological examination showing it to be melanotic sarcoma, and this operation was followed by recurrence. Radium was applied over the area in June and again in July, 1914. There had been no recurrence up to November, 1922.

The effect of radium in the treatment of angiosarcoma has been most satisfactory. In the case of a girl of sixteen a small rapidly developing tumour was to be found on the right of the bridge of the nose, caused, presumably, by irritation from glasses. It had developed in the course of a month. Radium was applied in May and June, 1920, after which treatment the lesion disappeared entirely, and has not recurred. A second case is that of Mr. S., aged 53, who presented a cystic angiosarcoma over the right ear. The lesion had been present since birth, and had gradually increased in size. It had twice been removed surgically, the last time being eight years before he came to me for treatment. Three months before he reported to me it had recurred. When I first saw the lesion, in October, 1921, it was a raised mass, irregular in shape, about one inch in diameter. He received radiation over the lesion in October, and November, 1921, and also in January, February, and March, 1922. At the end of this time he was free of disease, and there has been no tendency to recur.

Sarcoma of the conjunctiva responds most remarkably. I have had several very outstanding cases. Mrs. B., aged 60, noticed a small black pimple on the left eyeball in October, 1919. She sought advice and was told that it would be necessary to remove the eye. Just before consenting to this, she was sent to me for radium treatment in order to try to save the eye. Heavy radium exposures were given over the growth in December, January, and February, and when seen in March there was no evidence of disease. She has remained in excellent condition, and there has been no occasion to remove the eye. Another very excellent testimony as to the value of radium in this condition is the case of Mrs. H., aged 39, who had a sarcoma of the conjunctiva which had been present for one and a half years. In June, 1919, the growth was removed surgically, and post-operative radiation was given. Radium was applied to the conjunctiva at monthly

intervals until October, 1919, after which time the condition was considered most satisfactory. The patient reported in April of this year, approximately four years after receiving treatment, that there had been no recurrence of the disease.

Three other cases of sarcoma are particularly interesting: Case No. 243, Mr. R., was first seen by me in September, 1911, when he consulted me regarding a growth in the right orbit which caused a protrusion of the eyeball. It had been diagnosed by several men as an inoperable sarcoma. Radium, heavily screened, was applied over the temple at varying intervals for about a year, at the end of which time the disease seemed well in check. No further radiation has been necessary, and when the patient was last seen, in June 1922, there was no evidence of the disease. That is to say, the condition has remained clinically cured for over ten years.

Case No. 1936, Dr. S., aged 35, had first noticed shooting pains in his left knee joint, in August, 1918. These continued, growing gradually worse, until May, 1919, when he was quite lame. At this time there was an elastic swelling in the popliteal space. It was diagnosed as a bursitis of the tendon of the semimembranosus muscle. The swelling subsided readily under rest and pressure. In June of the same year, he was operated upon for removal of the bursa, when a hard mass, the size of a lemon, was found and removed. The pathological finding showed spindle-celled sarcoma. Another report named it "melanotic sarcoma?" There was no further trouble until March, 1920, when a recurrence appeared at the site of the original tumour. There was no pain or discomfort in the area. Three weeks after discovering this mass the patient came to me for radium treatment. At this time a specimen of the tissue removed in June, 1919, was sent to Professor James Ewing for examination. In his report of the tissue he stated that he considered it a very rare and interesting condition, and that he had only seen two other cases like it. He termed it a "xanthosarcoma," stated that it was only slightly malignant, and described it as being very similar to the giant cell sarcoma of the epulis type occurring in bone. He considered that the tumour might be safely removed and might not recur, although it had already reappeared. He advised the use of radium. Radium plaques, heavily screened, were applied over the mass at intervals during April, May, and June, 1920, giving in all 518 milligramme hours. A further slight exposure was given in October and again in December of the same year. I have had reports of this case from time to time, and to date, three years after treatment was given, there has been no recurrence.

Case No. 3171, Mr. C., aged 18, fell, on October 18th, 1922, injuring his right leg slightly and bruising the left leg below the knee. Rapid improvement was noted in the injury to the right leg. In November he noticed a lump the size of half a hen's egg at the site of the bruise on the left leg. This lump caused him no pain, it was soft and smooth in outline, and the skin over the tumour was normal. In a week's time the growth was seen to have increased in size, there was a definite lip-like appearance at the lower part of the mass and a cord of hard tissue was palpable, running from the lower margin towards the centre. Operation was advised and carried out on November 29th. The mass was found to be soft, haemorrhagic and attached to the periosteum but not involving the bone. Frozen section showed spindle cells with very little intercellular substance and a provisional diagnosis of spindle celled sarcoma was made. Later, paraffin sections indicated that the growth might be a rapidly developing endothelioma. At the time of operation, three ten milligramme tubes of radium were inserted in the wound, on the bone, the location of the tubes being changed from time to time to cover the entire area of attachment of the growth to the bone. One thousand four hundred and forty milligramme hours of radium were given. The stitches were removed on December 14th, and it was decided to give radium over the site of operation and X-rays from three inches below the patella up to and including the groin. This was, accordingly, done. On December 16th and 23rd, 1,460 milligramme hours of radium were given over the site of operation. The present condition, six months after operation, shows no evidence of recurrence. On account of the thinness of the flap, an ulcer at the centre of the wound developed, which extended down to the periosteum. No bare bone was discovered. At first the ulcer was the size of a fifty-cent piece, but it has gradually diminished to that of a ten-cent piece. His present condition is excellent. He has gained some thirty-five pounds since the accident.

These results are some indication of what can be done by the use of radium in sarcoma. Although it is often of little benefit, the good results often obtained undoubtedly justify its use in this condition.

XUM

MEDICAL EXPERIENCES AMONG THE KWQUITHLIH INDIANS ALONG DISCOVERY PASSAGE, B.C.

WILLIAM FYLE SHAW, M.D.

Campbell River, B.C.

DISCOVERY PASSAGE lies to the south side of the Seymour Narrows, over a hundred miles north of Vancouver. This passage is historic, as named by Captain Vancouver on his voyage of discovery in 1791; Cape Mudge, one of the Indian reserves is named after his lieutenant.

The central point for these Indians is Campbell River, a point on the Island just thirty miles from Nootka, first settlement on the western coast, well known to history by the exploits of the famous chief McQuinna, who in 1803 captured the good ship *Boston*, killing all on board but John Jewitt, whom he held captive three years, and whose narrative is still extant.

The tribes of this division are Wewayakium, Campbell River, Wewayakay, Cape Mudge, Kweahkahs of Quathiaska Cove, Wawlitsum, of Salmon River and the Homalco, Kliahoose and Sliamon bands, numbering over a thousand, the remnants of the thousands once living along the B.C. coast.

In the year 1916, March 3rd, I came to this district to take charge of the hospital at Campbell River, a centre also of logging camps, and was appointed Indian Physician by the Canadian Government.

I immediately assumed my duties. The field was practically virgin soil, the labours of a physician for a few months only preceding mine. I well remember my first trip to the largest village. A large Potlatch was in progress, and amid the beat of the drums and the gambling, I approached the tent of a sick visiting chief. He had contracted pneumonia, probably due to the great congestion of Indians, and was suffering severely; I applied treatment and gave medicine and started to return. Immediately I was beset on every side by the sick and maimed, old men with sightless eyes asked for restoration of sight, palsied limbs and tumours cried for relief. Not possessing the miraculous power seemingly demanded by these importunities, I was glad to escape and return home. From that time on I was initiated, and many variegated experiences succeeded one another.

On one trip soon after, I went to see Jim Nuknuk, father-in-law to chief Billie Assui, diagnosing an old blood condition—lues. I gave pot. iodide grs. 10 four times a day. Evidently there was an idiosyncrasy in this case, for next day I was summoned in great haste, and found the noble chief unable to see, the face swollen, and he showed other signs of distress. I was stoutly accused of poisoning this man, and beginning to be apprehensive, I explained the action of the medicine, "very bad sick, too long sick, medicine too strong," and stated that if they believed my intent to poison, surely they would refuse to take any more medicine from me. However, this phase of affairs did not appeal to them, as finally they said the evil spirit had been charmed out of me, accordingly I gave the antidote; you may be sure it was harmless medicine.

Salmon River Charlie was a great chief, and about to die. In the early hours of the morning I was sent for to attend him; the sick man lay gasping on a pallet, and it was plain that consumption was wasting his life; I applied the stethoscope to further ascertain. Immediately a terriffic din prevented me from hearing. Going to the side of the hut I found two men at carpenter work on a box, chiefly driving nails. As it was assuming the shape of a coffin, I became somewhat interested and was told that it was for the chief inside, who would shortly need it. Whether the plain forecast of his approaching end affected the chief, I could not see. It could not have been cheerful to say the least, and did not imply much faith in medical aid.

During the large congregation of Indians a year later, two babies were brought to me with what appeared to be ulcers on the arm. I could not account for these at the time, but later was told they had been bitten by the "wild man." It appears that this wild man is one of the characters of the Potlatch. He goes into the

XUM

woods naked for about a week, and finally arrives in the village in a wild state; part of the game being to bite any individual he sees. These two babies had been so honoured, and I am assured that it is a mark of distinction.

The custom of mourning for the dead was in full flower at this time, a day was appointed for the funeral, orations were given extolling the virtues of the dead man, his immediate relatives expressed grief by wailing and scratching their faces with their finger nails, even to permanent disfigurement, and the affair wound up by the presentation of money and various articles from a relative of the deceased, who was master of ceremonies for the day. It always fell to my lot later to administer to the wounds on the face, which were often difficult to heal, and entailed frequent dressings and care.

FIG. 1

In 1918, at the time of the influenza epidemic, I had just recovered from an attack when I received a call to attend the Homalco Indian at Church House, a man and boat having been sent to take me over. Owing to the state of my own health and a violent storm, I hesitated to go, but the man was very insistent, telling me the Indian was very sick and in great pain. Finally, I determined to take a chance with the sea and started out. It was a memorable trip and I believe that only an Indian could have navigated around the wind-swept and wave-lashed cape. At length, not without considerable danger and much sea-sickness, we reached our destination. I found an old Indian, the largest I have ever seen, lying dead; he was three hundred pounds in weight. The most disconcerting news to me, however, was to learn that he had been dead some considerable time before I had been sent for. It appeared that during an altercation the night before between this man's son and another Indian, probably due to drink, the huge man had intervened and the excitement had brought on apoplexy from which he died. It was the first time I had risked my life to bring medical succour to a dead Indian, and I must confess that after what I had gone through it took me some time to see the incongruity of the situation.

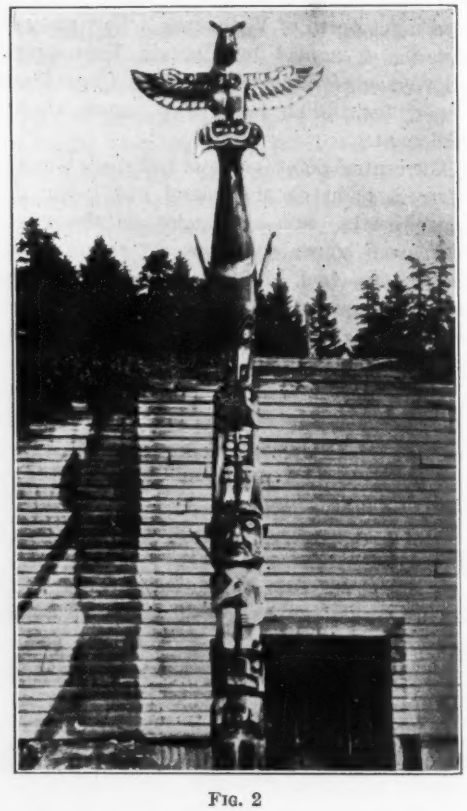

FIG. 2

The advent of pituitary extract was a notable discovery for the Indian, and he was greatly impressed with its virtues. On my first call to an obstetric case I had used it with such wonderful effect that leaving my patient for a few minutes to look in on another case, I came back to find the baby born. I had yet to learn that doctors did not attend during actual birth, for on my next case, after giving a hypodermic, and, intending to stay, I sat down to wait. I was shortly asked if I was about ready for the boat; I at once took the hint and departed, consequently the chief medical operation in the Indian obstetrical case consists in giving pituitary and making a gentle exit before the drug takes effect.

One of the reasons for the destruction of Indian villages on the coast has been due to the Indian funeral superstitions. Formerly when an Indian died in a house, it was burnt, of course after removal of the body. Later in my time, a hole was cut in the wall, and the corpse removed through it, as they would never take a dead man out of a door, for fear of future calamity. At present, an Indian about to die is usually removed to a small shack dwelling, where he spends his last hours, thus saving houses.

Salvarsan has proved a great boon to the Indian, and in these immediate tribes has been a most important health factor. According to Mr. William Halliday, Chief Indian Agent for the district, the Kwquithlih Agency, the Wewayakium and Wewayakum tribes are the only tribes in British Columbia that show an increase in births over deaths, and this only in the last two or three years. Undoubtedly, this is due to the fact that I have used salvarsan extensively in these tribes, which has resulted in the sterilization of the disease in infected stock and prevented the contamination of healthy stock. In connection with this, I would urge the increased use of salvarsan in Indians by Indian physicians and a greater interest in this factor by the Government.

The most remarkable instance of vitality in the tribes, was that of an Indian woman, Mrs. Oscar Louie. I operated for pelvic infection and encountered a very severe pelvic abdominal peritonitis, with such an amount of plastic inflammation as to occlude ovaries, tubes and bowels; drains were inserted and, despite hopeless prognostics, the patient survived, perhaps owing to a wonderful vitality derived from a race of hardy ancestors. She is alive to-day, and has lately presented her husband with a fine boy.

A fact of considerable disturbance when I first entered on work here was interference from medicine men who chanted weird songs over the sick, removed imaginary fishbones from various parts of their bodies, pocketed evil spirits, and in other ways negatived the work of the physician and made them despise the white man's medicine. An instance of this before the advent of the physician was told me by the missionary in this division. It seems at that time the Government supplied a few drugs to the missionary to dispense to the sick Indians. One day an old Indian demanded relief from a severe pain, the missionary, bethinking himself of his stock of medicine, gave him a half dozen one-half grain morphine tablets, for immediate relief, with instructions to take one and to keep some for future occasions, if necessary. As soon as the missionary left, the Indian made the entire lot into one powder and with the remark, "Ugh! White Man's medicine, him no strong," he took them all in one dose. It is needless to say that he slept, the unfortunate part being that he never wakened.

Fish poisoning, contracted at the cannery at Quathiaska Cove, was one of the most intractable diseases. It produces an inflamed and purulent condition of the tissues, of a very virulent nature. The poison infiltrates the tissues. The treatment consists in numerous incisions and continual compresses of antiseptic solution.

In this division the old order is changing, and civilization has been very rapid this last eight years. The prayers and laments to the old god Waikie, have ceased; no longer are provisions placed on the graves to sustain the spirit on its journey to the next world. Their emblem, "The Thunder Bird," still plays about the Totem Poles, but the ancient glory is departed. Many of these changes are due to the earnest efforts of the Rev. W. Scott to Christianize the Indian, which efforts are now almost crowned with success. The exertions of the Indian Agent, Mr. W. Halliday, to terminate the Potlatch, have also played an important part. A new Indian is rising on the ashes of the old, many now have modern houses and motor cars, and are rapidly taking a useful place in the White Man's civilization.

XUM

INDUSTRIAL MEDICINE: ITS MOTIVES AND MERITS*

BERNARD LANGDON WYATT, M.D.

Grand' Mere, Que.

THE development of the industrial system of to-day from the trade guilds of the Middle Ages has transformed the whole life of civilized nations and industrial medicine is of the utmost importance because it deals with the health, safety and human rights of the vast majority of the population.

The modern factory system, which had its beginning in Italy during the 15th and 16th centuries, is responsible for taking man out of his natural, pastoral environment and making it necessary for him to learn the use of strange tools and the operation of complicated machinery. With the passing of domestic and handicraft production came a concentration of population in manufacturing districts and it did not take long for industrial workers to realize that steam and speed had not improved their lot in life. It is, nevertheless, only in recent years that we have begun to understand and appreciate the underlying principles of the conditions affecting the health of the industrially employed.

Less than twenty years ago it was thought that there was but one fundamental factor in industry—production—but far-sighted employers have come to realize that there is another which is equally essential—and this second factor is *personnel*. In this connection, it is fitting to lay emphasis upon the fact that despite all improvements in labour saving devices, the human machine is and will ever remain the most vital and indispensable mechanism in the production of industrial wealth.

Now the problems of industrial medicine come under three general headings: (1) the prevention of occupational diseases and industrial hazards; (2) the prevention and control of communicable diseases in industry; (3) the correction of unhygienic conditions of life and work which determine or contribute to premature death. But before discussing some of the more important phases of industrial medical practice let me say that there should be nothing about it that savours of paternalism or philanthropy. Charity and business mix no more successfully than oil and water and, in my opinion, it is most unfortunate that the word "welfare"—which has long been identified with philanthropic endeavor—should ever have been applied to the efforts of industrial establishments to promote the health and safety as well as to improve the working and living conditions of their employees.

Sound industrial health work rests on six principles. First, it must be what it appears to be. It must define itself in its own terms. It cannot be substituted for the just demands of the workers. Second, it should embody the spirit of service. Third, it should be developed as the expanding consciousness of the workers calls for such service. Nothing should be thrown at or "wished on" them. Fourth, it should include preventive as well as curative measures. Fifth, it should take into consideration home and community conditions. Sixth, it should produce results that will justify the operating overhead.

Industrial medicine, in the ultimate analysis, must be advantageous to both employer and employee if it is to accomplish anything and economically sound if it is to last. Otherwise expressed, its effectiveness will depend upon the degree of cooperative effort and its permanence upon its dollars and cents value. This does not mean that intangible returns must be translated into financial equivalents but that the sum total of results must justify the operating costs.

As a substitute for security or continuity of employment, proper working conditions, reasonable hours of labour, fair wages, or any other fundamental factor of industrial relations, industrial health work suffers the fate of most attempted substitutions, but standing on its own merits it has and will continue to have a record of important achievement. The physician in industry has been defined as "one who applies the principles of modern medicine and surgery to the industrial worker, sick or well; supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation, and accident prevention; and who, in addition, has

*Annual Meeting of the Canadian Medical Association, Montreal, June, 1923.

an adequate and cooperative appreciation of the social, economic, and administrative problems of industry in its relation to society." Just what this means practically and what it amounts to from the standpoint of its value and importance may best be considered by taking up a few of the more outstanding aspects or subdivisions of industrial medicine.

A complete programme embraces activities which have been divided by Mock into two groups: (1) those directly concerned with health supervision, and (2) those which are adjuncts or auxiliaries. Under the former are the medical, surgical, dental, nursing, safety and sanitation services, while in the second group are the employment, restaurant, recreation, insurance, pension, loan, housing and community services.

Since there is much in industrial medical practice that is only of casual interest to the private practitioner, it has seemed desirable to limit the subject matter to those fundamentals which are of importance to both physicians in industry and their colleagues in general practice.

Let us begin with accident prevention, which is a function of the "safety service."

As Juhnke expressed it, "The end is that the workman shall live to enjoy the fruits of his labour; that his mother shall have the comfort of his arm in her age; that his wife shall not be untimely a widow; that his children shall have a father; and that cripples and helpless wrecks who were once strong men, shall no longer be a by-product of industry."

The different aspects of safety work relate to: (1) Organization, (2) Education, and (3) Safeguarding. Young, of the National Safety Council of the United States, has estimated the value of each as follows: Organization, 45%; Education, 30%; Safeguarding, 25%. Every means to engender a spirit of prevention should be employed and, not only should every effort be made to prevent accidents, but also, the restoration of an injured employee should be considered as being both a moral and an economic responsibility. The existing Workmen's Compensation legislation which merely provides for the payment of one-half of an employee's wages beginning on the eighth day after a disabling injury, falls very far short of the needs of the situation. Doctors' fees, hospital expenses and the services of a specialist, when necessary, should be provided at the expense of industrial establishments. The economy of liberality in this respect has been demonstrated by at least one Canadian company which has found that the reduction in the period of disability and the decrease in permanent impairments have more than justified the additional expenditures. Furthermore, the 1922 figures of this same concern showed that the lost time on account of accidents was 44% less than the average prior to the inauguration of modern safety measures. In other words, the maintenance of the "safety service" reduced by 44% the expenditures of the company for hospital bills, doctors' fees and compensation awards and at the same time saved the employees a similar percentage in the amount of wages lost on account of accidents.

First-aid departments are among the best investments that industrial establishments can make because of their value in preventing infections and other serious complications that may result from injuries. It should be emphasized, however, that a limited number of standardized methods employed by trained *personnel* under medical supervision are among the fundamental requirements.

In passing on to the consideration of industrial medical services, one finds that in addition to those matters directly related to medicine and surgery, they are ordinarily concerned with a variety of interests, among which may be mentioned: physical examinations, personal hygiene, plant sanitation and occupational research. In connection with the physical examinations, it should be thoroughly appreciated that they are not a scheme either for weeding out employees who are beginning to wear out or for depriving handicapped applicants of a chance to get a job. As a matter of fact, the only reasons for rejecting an applicant for employment should be three: (1) when it would be a source of danger to himself, (2) to his fellow workers, or (3) to property. Life insurance companies have reported that periodic physical examinations have a potential life saving value of $30.00 each. Industrial workers cannot be properly and efficiently placed unless something is known about their physical condition and through such examinations threatened disease is discovered while it is still preventable or at least curable, conditions are detected which make the employee prone to accidents or to cause accidents to others, the working force is protected from communicable diseases, mental deficiencies and physical handicaps constituting a health hazard are brought to light, both

XUM

temporary and permanent incapacity is reduced, the amount of wages lost on account of illness is cut down, and the cost to the employees of their health insurance is greatly diminished.

The need of physical examinations is well illustrated by a recent study of the Laurentide Health Service records of all applicants and employees between the ages of 16 and 20. The analysis of this group showed:

Number classified as (1), or physically fit for any employment—1 or 1.3%.

Number classified as (2), or physically fit for any employment, but substandard in some respect—51 or 63.7%.

Number classified as (3), or physically fit for specified employment only—15 or 18.7%.

Number classified as (4), or physically unfit for any employment—13, or 16.3%.

There were 9 with tuberculosis, 3 with heart disease, 6 with defective vision, 6 with defective hearing, 2 with hernia, 36 with badly diseased teeth and 36 with grossly enlarged tonsils and adenoids. The majority had more than one form of physical defect. Some one has said that there are lies, damned lies, and statistics; furthermore, our figures are for a very small group; but if, by any chance, they represent the conditions among young industrial workers generally, they reflect a sad state of affairs.

From the standpoint of personal hygiene, the needs of each employee are discovered by the examining physician and the necessary instruction is given to meet the individual requirements. Now, the success of industrial health work will be proportionate to the extent of the development by the workers of a higher sense of responsibility for the care of their bodies and those employees who are most receptive to the hygienic principles of life and work are rewarded for their efforts by enjoying the highest reaches of working power and all that it implies from the standpoint of financial returns and advantages.

The problems concerned with plant sanitation are among the most fundamental with which industrial medical services have to deal and it is the duty of every physician in industry to improve the sanitation conditions in his plant to the end that the workers will have the greatest possible protection, the company will receive the greatest possible benefits from the improved conditions and the sanitary standards of the plant will serve as a model for others. Such an effort would constitute the greatest public health movement ever inaugurated in the country and the men responsible for it would take their places in the foremost ranks of the medical profession. The specific problems of plant sanitation in any given instance will depend upon the nature of the industry and the physical conditions of the plant and its surroundings. It is obviously not intended that the sanitary engineer shall be supplanted, but it is expected that every physician in industry will have some knowledge of the essential principles of sanitation and that there will be the closest co-operation between industrial physicians, sanitary engineers and operating managers in making and keeping shops and factories sanitary and healthful.

In connection with occupational research, industrial medical services may render great assistance to employment departments by studying the factors concerned with the mentality of the worker, his physical status, the conditions of work and the working place, the materials, processes, etc., so that employees may be placed in positions which will not be prejudicial to their health. Experience has shown that too few medical men are acquainted with industrial processes and that relatively few employment managers have any conception of the medical problems concerned with industrial occupations. Except in rare instances, but little attention is paid to the kind of work to which employees are mentally and physically adapted although, from every point of view, there is nothing more unfortunate for any worker than incompatibility with his job.

The returns from industrial medical services to both employer and employee are of the greatest value and importance. The character of the services rendered makes the assignment of financial equivalents a relatively simple matter and the 1922 report of one Canadian plant showed a financial return of $23,361.62 on a medical service expenditure of $7,436.50.

Time will not permit of a discussion of dental insurance and other subdivisions of industrial health services. There are, however, three important facts that I want to leave with you. The first is that in addition to the economic soundness of industrial medicine as demonstrated by the financial returns, there are still more important intangible results which cannot be translated into terms of dollars and cents but find expression in greater loyalty, greater contentment, greater co-operation, greater production;

XUM

and less absenteeism, less labour turnover and less operating expense. The second is that from the standpoint of those in general practice, physicians in industry are collaborators rather than competitors. They do not deal with conditions of non-industrial origin and they advance both the professional and financial interests of their colleagues who are engaged in private work. The third thought that I want to emphasize is that industrial medicine is concerned not only with medical but also with social and economic problems, and that these matters are of vital importance to the very existence of our present social order.

THE TREATMENT OF BLADDER TUMOURS*

ROBIN PEARSE, F.R.C.S., F.A.C.S.

Chief Assistant, Department of Urology, Toronto General Hospital

HISTOLOGICALLY, bladder tumours are classified as innocent and malignant, clinically they are all malignant, every gradation being found from the so-called benign papilloma, through the stalked papillary carcinoma and the cauliflower tumour to the flat sessile carcinoma involving the whole thickness of the bladder wall and invading the cellular tissue beyond it.

For the successful treatment of any type of bladder an early diagnosis, appropriate treatment, and regular follow up examinations are essential.

The benign papilloma consists of a slender stalk bearing fine discrete villi which do not adhere at their edges, the muscular layer of the bladder wall is not involved and metastatic growths do not occur. The tumour, as a rule single at first, multiplies by seed implantation in the bladder until the viscus is filled with tumours of varying age and size, sooner or later the villi thicken and adhere at points of contact, the cells undergo mitotic division, lose their regular arrangement, the growth becomes a carcinoma, and infiltration of the bladder wall occurs. It must not be inferred that all papillary carcinomata start as benign tumours, the growth may be malignant from the first but the etiology is certainly similar for a papillary carcinoma may recur as small groups of benign tumours and a benign papilloma may recur in the malignant form.

The prominent symptom of these growths is haematuria, small in amount in the early stages amounting often to no more than a few drops squeezed out at the end of micturition, it will clear entirely for longer or shorter periods giving false hopes of cure while the growth advances beyond nonoperative control; hence the importance of immediate cystoscopy in every case of haematuria of unknown origin.

The sessile tumours are infiltrating carcinomata, the surface of the tumour may be covered with short villi giving the familiar cauliflower appearance or it may be smooth, or ulcerated and necrosed. These growths are usually single and remain so, they involve the whole thickness of the bladder wall and quickly invade the peritoneum and the cellular tissue of the pelvis, later secondary growths appear in the pelvic bones, lungs, and other organs.

The early symptoms before ulceration occurs are those of a mild chronic cystitis, more severe if the growth is near the trigone, quite slight if the growth is at the fundus; periods of haematuria now occur and become more frequent and severe, sometimes culminating in clot retention. Necrosis and infection produce a violent cystitis and pave the way to death from ascending infection.

The following procedures are in vogue for different types and stages of bladder tumours: (1) Fulguration through the cystoscope. (2) Suprapubic cystotomy and fulguration through the open bladder. (3) Suprapubic cystotomy and excision of the growth with the submucosa. (4) Partial cystectomy. (5) Radium and deep X-ray therapy. (6) Permanent cystotomy.

Fulguration is not cauterization, it is heat coagulation of the deeper cells which form the root of the tumour in the bladder wall by means

*Read before the Academy of Medicine (Surgical Section) January 16th, 1923.

XUM

of a current of very high voltage, low amperage and very rapid alternation; the blood supply of the tumour or of a portion of it being thus cut off, aseptic necrosis occurs and when the slough has separated, which happens after about ten days, normal regeneration takes place. From two to six treatments are required.

The current is obtained from any one of a variety of machines designed for the purpose; one electrode is large and placed under the back of the patient or the wire may be connected with the metal knee crutch, the other electrode is small and applied to the tumour; the maximum heat is produced about one centimetre from the small electrode, that is in the root of the tumour, if contact between the electrode and the growth be broken sparking and superficial cauterization will occur, this is not adequate for our purpose.

Fulguration through the cystoscope is the method of choice in all tumours with a definite pedicle where the tumour is not more than an inch or so in diameter and the seed tumours are not so numerous as to preclude the destruction of them all in a reasonable number of treatments. The extent of tumour formation which can be dealt with cystoscopically depends on the skill of the operator; in extensive cases it is well to give a general anaesthetic for the first treatment, the small ones can then be entirely destroyed and the larger ones got under control at one sitting. Snaring or cutting off papillomata through the cystoscope is bad practice as it leads to implantation tumours.

Experience will show that certain pedunculated carcinomata with thick villi cannot be controlled cystoscopically, these cases and those bladders with extensive benign papillomatosis must be treated through the open bladder. The large indifferent electrode covered with a pad wet with saline is placed under the patient's shoulders taking care that good contact is made so that sparking, which would result in a burn, is avoided. Under gas oxygen anaesthesia the patient is placed in the Trendelenburg position and a median incision made from the symphysis pubis towards the umbilicus, the peritoneum is stripped up from the front of the bladder and the bladder opened widely and a self-retaining retractor inserted; the growth is wrapped in gauze (if large enough) and pulled upon to stretch the pedicle, two small electrodes are then held at opposite points at the base of the pedicle and the growth burnt off, one of the electrodes is now discarded and its wire connected with the large electrode under the patient's shoulders and the base of the tumour is treated, lastly any implantation tumours present are destroyed. No ligatures are necessary even for large tumours, the advantage of this when the tumour is over the intramural portion of the ureter is obvious. The bladder is closed with a Connell stitch, a 28 F. De Pezzer tube being inserted at the upper end of the incision, a small rubber drain is placed in the space of Retzius and the wound closed. The lowest stitch through the rectus sheath should include the bladder wall at the upper end of the bladder incision, a dead space and leakage of urine into the upper part of the wound is in this way avoided. The drain is removed in twenty-four to thirty-six hours and on the fifth day the De Pezzer tube is removed and an 18 F. button catheter inserted in its place, this is discarded about the eighth day and, if no urine is passed per urethram in forty-eight hours, a catheter is tied in until the wound has healed. Beginning on the second day after operation, the bladder is irrigated daily with 1/8000 silver nitrate solution, no force must be used, the barrel of a glass syringe is inserted into the De Pezzer tube, a small quantity of the solution poured in from a jug and allowed to run out and the process repeated.

Suprapubic cystotomy and excision of the growth with the submucosa is applicable to papillomata too large for cystoscopic treatment. Great care is necessary in handling the growth to avoid soiling the bladder walls and producing implantation tumours. The usual site for recurrences after this operation is the suprapubic scar. On the whole the open fulguration method is preferable.

Partial resection of the bladder is the method of choice in dealing with a sessile or infiltrating carcinoma and is the only treatment at present available which is likely to give a good result. Unfortunately, many cases come too late for operation especially those where the growth (as is usually the case) is situated at the base of the bladder. The extent of bladder wall infiltrated by the growth is not so important in determining the operability as is the presence of infiltration in the pelvic cellular tissue as determined by rectal or vaginal examination, and the presence of secondary growths in bone or other organs.

The technique of operation is briefly as follows: Under gas oxygen anaesthesia the patient is placed in the Trendelenburg position and a

median incision made from symphysis pubis to within an inch or so of the umbilicus, the recti are retracted and the hand passed down into the lateral vesical space on the side corresponding with the site of the tumour. The peritoneum is separated from the bladder to within three-quarters of an inch of the situation of the tumour which can be felt at this stage through the bladder wall. Working around on each side of the tumour the peritoneum is separated from the bladder as far as can be reached, the peritoneum is incised transversely and by continuing the incision a portion of peritoneum is excised and left attached to the bladder. The peritoneal cavity is now closed and we have the bladder isolated extraperitonealy. If the growth is so near the ureter that there is danger of dividing it in the excision, it should be identified at this stage. The bladder is now opened half an inch from the tumour and the incision continued around the tumour thus removing the portion of bladder wall carrying the growth with a frill of normal bladder wall surrounding it, if the ureter is cut it is sewn into the incision as the bladder is closed, a De Pezzer catheter is inserted into the upper end of the bladder incision and a rubber drainage tube placed extravesically to take care of any leakage and the wound closed. The reconstructive power of the bladder is remarkable; a cavity holding a drachm or so at the end of the operation will in six weeks have expanded to an approximate normal capacity.

The results of radium treatment do not justify its use as an alternative to partial cystectomy where the latter is possible. Radium is of use as a palliative measure in inoperable cases and for treating recurrent carcinomata; it may be used in needles imbedded in the tumour or in a tube resting on the surface of the tumour and packed in position with gauze which also serves to separate the healthy bladder from the tube. The insertion is done through a suprapubic incision. After ten to fifteen hours the radium and packing are removed and a button catheter inserted. Small recurrences may be treated by inserting radium needles or emanation points through the cystoscope.

It may be advisable to precede the introduction of radium by a deep X-ray treatment given the day before operation, in which case healing of the wound will be delayed.

Very advanced cases with extensive infiltration of the pelvis are best treated with morphia, a permanent cystotomy being done if the pain and frequency is great or if there is urethral obstruction. Radium or X-rays in these cases will merely increase the torture by increasing the sloughing and cystitis, the expression one often hears, "it can't do any harm and may do some good" is far from the truth.

As a summary one may say that if satisfactory results are to be obtained immediate cystoscopy is essential in every case of haematuria of unknown origin. Fulguration through the cystoscope is the method of choice for small papillomata, fulguration through the open bladder for large ones. Partial cystectomy is necessary for sessile carcinomata. Radium and X-rays should be reserved for inoperable cases and recurrent carcinomata. Some cases are too far advanced for even this treatment. Patients must be reexamined two months after operation and if free of growth, six months later and again after a further six months.

A Study of Thirty-Four Cases of Abscess of the Lung.—A study was made by J. J. Singer and Evarts A. Graham, St. Louis, of thirty-four cases of lung abscess. Eight cases followed tonsillectomy. Of thirteen patients submitting to operation, six died, a mortality of 46 per cent. A third patient operated on died several months later with extensive carcinomatous metastes. The authors state that abscess of the lungs is being recognized more to-day than heretofore. The large number of tonsillectomies done is one factor which is responsible for what is apparently a greater number of abscesses than formerly. Early recognition and operation before the abscess has become chronic frequently prevents the failure of treatment, although many patients will recover with non-surgical treatment. Careful history taking, physical signs, use of the roentgen ray and diagnostic pneumothorax make early recognition possible. Patients who do not recover in two or three months need surgical treatment. —*Jour. A. M. A.*, July 21, 1923.

XUM

REPORT OF THE EPIDEMIC OF TYPHOID FEVER AT MANSONVILLE, QUEBEC

H. E. Gillanders, M.D.

Mansonville, P.Q.

A REPORT of the recent epidemic of typhoid which occurred at Mansonville, will probably be of interest to the medical profession. For that reason as well as for any lesson which may be gained from our experience here I am writing this report.

The cause of the epidemic was a contaminated water supply without doubt, although it must be acknowledged that repeated tests of the water failed to discover any typhoid bacilli.

On February 27th, I was called in to see a young man, a railroad employee who lived about two miles from the village, he was suffering from an intense frontal headache, fever and malaise. After making a complete physical examination I discovered in his urine a large amount of albumen, numerous casts, and a few red blood cells. I consequently made a diagnosis of acute nephritis and treated the case accordingly. The nephritis improved almost immediately but the condition of the patient grew worse, and it was the eighth day of disease when I made the correct diagnosis of typhoid fever and ordered the proper precautions to be taken for the isolation of the patient. The patient made a rapid recovery and it was only after the outbreak of typhoid fever in the village that we discovered that the drainage from this farm house finds its way indirectly into a small stream which forms part of the water supply to the village reservoir about one mile below.

On March 21st the first patient of the general outbreak came to my office for consultation. However, I was unable to do anything that day as I had been suffering for three days already with hiccough, and was taken to the Royal Victoria Hospital, Montreal, the following day, when a diagnosis of encephalitis was made and it was only on March 27th when I was able to resume work.

In the meantime, Dr. A. C. Paintin, of Knowlton, had been called in consultation by several families and had expressed a suspicion that typhoid fever was the cause of the outbreak.

The epidemic by this time was general throughout the village with scattered cases, mostly school children, in the country. With the assistance of two district nurses, as well as many private nurses, and Mr. M. R. Stalker, medical student at McGill University, I attempted to treat the people in their homes. It soon became apparent that this was impossible as whole families were prostrated and were suffering from lack of care so we organized an emergency hospital in the schoolhouse on April 17th. There we treated thirty-six patients (taken from poorer families who were unable to pay for private nurses). Two of our hospital patients died. It was just at the time Mr. Stalker had an attack of acute appendicitis and was removed to the Montreal General Hospital for operation. I then secured the assistance of Dr. A. C. Paintin, of Knowlton. Here let me express a word of appreciation to Dr. Paintin for his unfailing cooperation, courtesy and support in every emergency. It was indeed a pleasure to work with a man of such sound judgment and wide clinical experience. The worst of the epidemic soon passed over, Dr. Paintin returned to his home on May 19th, and we closed the hospital on May 27th. At present writing there are only two cases in bed and these are convalescent.

Type of Disease

It was an extremely malignant type of infection, a great many cases coming down acutely with high temperature, intense headache, backache, and pronounced nervous symptoms. Relapses and haemorrhages were frequent and toxic delirious cases very common. The majority of deaths were due to exhaustion from a deeply toxic condition, the heart becoming rapid, irregular and gradually weaker. No case of sudden heart failure was observed.

Death Rate

There were 205 cases in all with sixteen deaths, making a death rate of 7.8 per cent. One death

was due to perforation; three to haemorrhage and the others to exhaustion with the various complications of pneumonia, haemorrhage, and parotitis; five of the deaths reported occurred in various places outside Mansonville.

Sex.—Eighty-eight cases were male; 107 cases were female.

Age of Patients.—1st decade, 45 cases; 2nd decade, 67 cases; 3rd decade, 26 cases; 4th decade, 26 cases; 5th decade, 28 cases; 6th decade, 8 cases; 7th decade, 5 cases.

Complications

Bronchitis was very common, so common in fact as to be almost a symptom of the disease. No definite figures are available. *Haemorrhage*; twenty cases, *i.e.*, 9.7 per cent. The percentage is actually higher, because I know there were cases which escaped observatoin in private houses or were not recorded. Eight of these cases ended fatally; three only being directly due to haemorrhage, the others dying from a complicatting pneumonia or from exhaustion, etc. On the whole, it has been my observation that a haemorrhage of the bowel is, in a majority of cases, beneficial to the patient and that a marked improvement usually begins at this time. It has occurred to me that the blood lying in the lumen of the bowel acts as a foreign protein, is absorbed as such, probably through the ulcerated areas, and creates an active immunity against protein in general, of which the typhoid protein is one. Would it not be worthy of trial for some investigator to try the effect of injecting a foreign protein by rectum into the large bowel as a form of treatment? *Perforation*; there was one case. The perforation occurred during a relapse and did not follow a haemorrhage. The patient died. *Parotitis*; two cases, both fatal. *Submaxillary Adenitis*; one case, recovering. *Cholecystitis*; three cases; two during the course of the disease, one during convalescence; all recovered without operation. *Otitis Media*; one case. *Pneumonia*; six cases; four of these were fatal with additional complications of haemorrhage or parotitis and great toxaemia. *Haemoptysis*; one case; the patient, a little girl of thirteen years, coughed up about one cupful of blood, recovery. *Retention of Urine* was fairly common; four cases had to be catheterized for about one week. *Hyperpyrexia*; two cases; one case had a temperature of 107° and died two weeks later in the Royal Victoria Hospital following an attack of pneumonia; the other case had a temperature of 106.4° and recovered. *Acute Nephritis*; two cases; one fatal, which was complicated by a relapse and three haemorrhages, also died in the Royal Victoria Hospital. *Mastitis*; three cases. *Abortion*; five cases; every case of pregnancy terminated in abortion. *Convulsions*; one case. This was an extremely interesting case with marked nervous symptoms; symptoms of meningeal irritation, when she would scream at the top of her voice and finally go into convulsions. Her temperature rose to 106.4° on one occasion. The patient recovered. *Neuritis and Painful Muscles*; was a frequent complication of convalescence. *Arthritis*; one case affecting the ankle joints. *Abscesses* were very common, one patient having twenty abscesses; four cases had ischio-rectal abscesses. *Phlebitis*; one case. *Post Typhoid Insanity*; two cases, both recovering. *Recrudescences and Relapses*; eighteen cases (8.7%) two were fatal. There were several cases where the patient had a prodromal attack of fever lasting three to five days with all the symptoms of a beginning attack of typhoid fever. This is a phenomenon I have not seen recorded. I have one beautiful chart of such a case. *Previous History of Typhoid Fever*; one case.

Symptoms.—The symptoms of typhoid fever are so well known that I can add nothing. However, I could not help but be impressed with the universal complaint of headache. Sometimes frontal, sometimes occipital, and sometimes in the vertex, but always intense and persisting. An insidious onset usually so characteristic was marked by its absence.

Treatment.—Prophylaxis, of course, is the best treatment. I owe my own escape to having been inoculated one year ago. There are several returned men in town who were inoculated in the army four or five years ago. Of these only one came down and he had a very mild easy course. During the early part of the epidemic I used for inoculation purposes ordinary typhoid vaccine. Amongst the patients inoculated, ten came down before the inoculation was completed and eight subsequent to the third inoculation; the presumption being that they were in their incubation period while being immunized. Of these patients only one died, the others running comparatively mild courses. Later in the course of the epidemic I began to use typho-serobacterin (mixed typhoid and paratyphoid A and B.) both for immunization and treatment. This is a suspension of bacteria combined with specific

XUM

immune serum. By this process the manufacturers claim to do away with the clinical negative phase of ordinary vaccine and to give immediate protection. This appears to be borne out by my experience for of all the cases I inoculated with the vaccine, and they were many, only one came down subsequent to the first inoculation.

I treated thirty-two patients by giving subcutaneous injections of the same vaccine 1,000 million every three days. Fourteen of these patients were treated from the beginning of their illness. All had mild or moderate courses with no complication whatever and no deaths. The eighteen other patients began their treatment late in the course of the disease, five subsequent to relapse. Complications in this series were frequent but all of them recovered. These were not picked cases, but when I was convinced of the value of the treatment I treated every patient with vaccine. Previous experiences with ordinary vaccine gave no results whatever to my observation.

Early in the course of the epidemic I treated fourteen patients by intravenous injection of twenty-five million typhoid bacteria. In only three cases was there any marked improvement. These three cases, however, showed a phenomenal improvement. They were all three early cases with a very high temperature, severe bronchitis and great toxaemia. Subsequent to one injection each, the aspect of the patients completely altered and they ran mild uneventful courses to recovery. In the other cases treated by the intravenous method I could see no results whatever. In only two cases did a chill follow the injection. It is my opinion that better results can be obtained with larger doses and it was only fear of disastrous results that kept me from employing them.

Another method of treatment I employed with marked success was the intramuscular injection of boiled milk, 5 cc. in children and 10 cc. in adults every three days. This treatment to be of any value must be given early in the course of the disease. Eleven cases so treated ran very mild easy courses, four of them clearing up within seven days. There were only two cases in the series complicated with superficial abscesses. There were no other complications. Children gave a much more favourable reaction than adults to milk injections. Milk given later in the course of the disease had no effect whatever. Amongst ten cases given milk injections late in the disease, all very grave, four ended in death. None of these patients had any haemorrhage subsequent to the injection of milk. In fact I used milk freely as a haemostatic serum.

We used drugs purely as the occasion demanded, stimulants as they were required and morphia when indicated. A hypodermic of morphia given to a restless delirious patient will give him a long quiet sleep from which he usually wakens much refreshed and in a clearer mental condition than before. Paraldehyde by rectum on occasions gave equally good results.

There is one drug we used with much success. That is pyramidon (Hoechst). If pyramidon is given to a typhoid patient in the *status typhosus* with a high temperature, thick, swollen, heavily coated, brown tongue, and bleeding lips, it is truly remarkable to note the improvement in condition. The temperature falls almost immediately, the pulse also becomes less rapid, the mouth becomes moist, the tongue clean and the mental condition improves. This has been my observation in every case so treated. Dr. Paintin observed in one of his cases that he had to stop the treatment owing to the deleterious effect on the pulse. In other patients, who were running a prolonged course of fever when they should normally have been convalescent, a few doses of pyramidon brought the temperature to normal where it remained after the withdrawal of the drug. Pyramidon is closely related to antipyrin from which it differs by the addition of the dimethylamido group.

After all our treatment is exhausted, however, we fall back upon nursing as the one treatment, *par excellence*, for typhoid fever. The patients which we had transferred to the hospital, away from the influence of their anxious friends, where they were regularly fed, watered, sponged and given enemas, immediately began to improve. Treatment in the home even with two private nurses in attendance was much less satisfactory, and it was here in the private homes with private nurses where the mortality was heaviest. The poor people, removed to the public hospital, escaped lightly.

XUM

Case Reports

CASE OF STREPTOCOCCUS VIRIDANS BACTERIAEMIA WITH ENDOCARDITIS AND APPARENT RECOVERY*

HARRIS MCPHEDRAN, M.B.

Toronto

H. L., age 45, admitted to St. Michael's Hospital January 7th, 1922, following injury to left arm while working for the Toronto Transportation Commission.

Previous illnesses, none.

Examination showed fracture of left olecranon process, which was treated in the usual way. On January 10th, 1922, it was noted by the attending surgeon, Dr. Malcolm Cameron, that the patient was rather pale and was running an evening temperature of 99° to 100° F. Blood examination showed as follows: red blood corpuscles, 3,400,000; white blood corpuscles, 7,200; haemoglobin, 60%; urine normal; heart, lungs and abdomen seemed normal. I saw him again on January 20th, 1922, and reported as follows: teeth and gums diseased; tonsils normal; heart apex in 5th space mid-clavicular line, rate normal, rhythm regular, blowing systolic murmur; lungs clear; spleen not palpated; fever evening rise to 99° to 100° F.

In view of (1) continuous low grade fever, (2) secondary anaemia, and (3) mitral murmur, I advised blood culture for streptococcus viridans. During examination patient declared that apart from arm he was not now, and never had been, ill and at the time of accident he was swinging all day a ten pound hammer on construction work. On January 25th, 1922, he left the hospital against advice, still vowing he was not ill, but promised to return for report of blood culture.

February 3rd, 1922; blood examination showed red blood count 3,200,000, white blood count 8,500, differential, polys. 70%, lymphs. 23%; blood culture positive for streptococcus viridans.

February 17th, 1922; streptococcus viridans again found in the blood and patient urged to return to the hospital.

March 1st, 1922; patient readmitted, still feels well. Heart one inch outside mid-clavicular line, mitral murmur still present, no evidence of aortic regurgitation, spleen not palpated, blood not examined.

March 13th, 1922; no fever since admission, transfused 1,100 cc. blood by direct method; patient had very little reaction following this.

March 16th, 1922; red blood count 4,000,000 haemo globin, 42%; white blood count 6,000.

March 28th, 1922; blood culture sterile.

April 6th, 1922; general condition good, no fever for three weeks; appetite good, R.B.C. 4,400,000; haemoglobin 65%; blood culture sterile; heart apex at mid-clavicular line, mitral murmur still present, no aortic diastolic; spleen not palpated. Diseased teeth were extracted. Patient stayed in hospital till June 7th, 1922. Blood culture remained sterile and heart became normal in size; blood count normal but haemoglobin 65%. Patient stated he never felt better in his life. Diagnosis, streptococcus viridans bacteriaemia with apparently mitral endocarditis.

Progress.—January 3rd, 1923, red blood count 4,400000, white blood count 5,600, haemoglobin 67%. Patient at this time doing heavy work with the Transportation Commission and had been doing so for several months past and feeling well.

February 23rd; again examined; blood culture sterile; liver enlarged.

Horder[1] gives four cardinal signs of subacute bacterial endocarditis; (*a*) multiple arterial embolism, (*b*) endocarditis, (*c*) isolation of bacteria from blood stream and (*d*) fever. Of these the patient had the last three with a well marked secondary anaemia but no enlargement of the spleen, and no embolism noted at any time. Libman[2] has seen four cases in his series up to 1920 recover.

One thing that impressed me was the sense of well-being in one whom ordinarily one considers suffering from a fatal illness. His accident may have saved his life, in that he was forced to go to bed and remain there. Otherwise, the disease must surely have progressed more or less rapidly as patient felt in nowise ill at the time of the accident, and did very heavy manual work, and that in face of a red blood count of 3,200,000 and haemoglobin 60% without any shortness of breath or weakness, symptoms which under the

*Read before Section of Medicine, Academy of Medicine, Toronto, February 13th, 1923.

circumstances one would have thought inevitable.

Transfusion, I think, may, to some small extent have altered the course of the disease. He was afebrile at the time it was done and for some time before; it did improve his blood picture and may have been a factor in a more rapid restoration to health.

The future alone can tell whether a permanent cure has been effected but while in the hospital from time of second admission on March 7th, 1922, up till June 7th, 1922, the blood remained sterile. Since leaving the hospital he has worked hard and still feels well.

REFERENCES

(1) HORDER, *Brit. Med. J.*, April 28th, 1920. (2) LIBMAN, *Idem.*

Efficacy of Antivariolar Vaccination in the Phillippines During 1921 and 1922.—In Manila, where there had been performed every year higher proportions of successful vaccinations, smallpox completely disappeared in 1921 and 1922; the last five cases, with three deaths, occurred in 1920. In the provinces and in Mindanao and Sulu, the disease could be controlled to its possible minimum, there being morbidity and mortality rates, per 10,000 population, of 1.58 and 0.73 respectively, in 1921. Regino G. Padua, Manila, P. I., says it is noteworthy that, in places where the percentage of immunized population was the highest, the morbidity and mortality rates have been the lowest, and conversely—in other words, in Mindanao and Sulu, where there have been more numerous obstacles to successful vaccination; hence, the estimated percentage of immunity being only 14.78 per cent., the morbidity and mortality rates had been during the year relatively more exuberant: 18.76 and 9.57 respectively. The returns of 1922, from five provinces under the Division of Provincial Sanitation, show 126 cases with twelve deaths from smallpox and, from one province under the Division of Mindanao and Sulu, fourteen cases with seven deaths. The morbidity and mortality rates per 10,000 population for the former were approximately 0.13 and 0.01, and for the latter 0.12 and 0.05, respectively. For comparison, such rates in 1920 were 0.17 and 0.10 for Manila, 11.85 and 4.97 for the provinces, and 89.48 and 46.45 for Mindanao and Sulu. Obviously the disease is gradually disappearing. The vaccination process, systematically conducted every year in all parts of the archipelago, has been the potent factor in this rapid reduction. As a result, 17.31 per cent of the total population had been immunized in 1921, against 15.87 per cent. in the yearly average of ten years ending 1920. Interpreting the statistical results, Padua believes that protection of the public is afforded by systematic and successful antivariolar vaccination. There are no other factors to which the eradication of smallpox in Manila and the rapid reduction of the morbidity and mortality rates in the provinces during 1921 and 1922 may be chiefly ascribed. —*Jour. A. M. A.*, May 12, 1923.

The Patient's Mind.—William House, Portland, Ore., summarizes his paper as follows: The sick body is always accompanied by a sick mind. Many sick persons have no organic disorder, but suffer from the effects of suggestion either from within or from without. If suggestion produces disease, it can also cure disease. Recovery of both mind and body is retarded by fear, worry and misinterpretation of symptoms, and is hastened by their removal. Much of the success of the cultists is due to their ability to inspire hope. All that they can do can be better done by trained physicians. There is nothing mysterious is scientific psychotherapy. Every physician consciously or unconsciously uses it in his practice. It consists in finding out what is going on in the patient's mind and relieving it by rational explanation and encouragement based on accurate diagnosis. Psychotherapy should supplement and not displace other recognized forms of treatment. Scientific minds will respond to scientific methods, but child minds can be reached only by methods suited to their limitations. —*Journal A. M. A.*, July 21, 1923.

Retrospect

SOME ASPECTS OF EXPERIMENTAL PNEUMONIA*

ARCHIBALD MALLOCH, M.D., M.R.C.P. (*Lond.*)

Assistant Physician, Royal Victoria Hospital, Montreal

IT is not the intention to discuss in this review all the varied aspects of experimental pneumonia; the subject is too vast and brings with it many fundamental problems of immunity. Occasional references, however, will have to be made to such questions as the relative susceptibility of different classes of animals to pneumonia and the dosage and virulence of different strains of microorganisms. Immunology attempts to answer questions about the "seed" and "soil." You may remember Charles Kingsley's book, *Madame How and Lady Why*; problems of immunity are for "Lady Why" to solve; we are concerned with the minor question, "How does pneumonia develop?"

The earliest experimental work, to which numerous references are given in the *Catalogue of the Surgeon General's Library*, deals with the production of pneumonia after the lung has been disabled or put out of action by section of the vagus nerve, no organisms being injected to excite a response. The "soil" was merely prepared for "seeding" with organisms already present in the respiratory tract, and it is possible that we have, in traumatic pneumonia, an analogy in man. I have seen at least two cases without fracture of the rib, one in a soldier during the European war, who was struck on the back by clods of flying earth, and the other in a meat porter of Smithfield Market, whose back was severely injured by a falling carcase. Against this idea of a rapid onset of pneumonia after trauma, Meltzer and Wollstein showed, in 1919, that they were unable to produce pneumonia in animals after section of one vagus, unless they waited for ten days before injecting a dose of virulent pneumococci into the trachea. They suggested that the delay was necessary because the vasodilators do not degenerate until ten days after section of the vagus, although the vasoconstrictors degenerate after the lapse of four days.

It has for long been much debated point whether lobar pneumonia is haematogenous or bronchiogenic. In support of the former view it has been put forward that the consolidation involves a whole lobe quite impartially and that the pneumococcus may be grown from the general circulation in the course of the disease. The former argument does not carry much weight with it, for Kline and Meltzer showed, in 1915, that hepatization of the lungs—to the naked eye identical with lobar pneumonia—could be produced by blowing down into the trachea of a dog suspensions of such substances as aleuronate (a flour consisting largely of vegetable albumin), starch, egg-yolk, and lecithin. Under the microscope the exudate in the air sacs was seen to consist of red and white blood cells and a good deal of fibrin. The argument from positive blood cultures loses some of its value, for Cole and his fellow workers at the Rockefeller Institute have shown that positive blood cultures in lobar pneumonia are found only in severe cases, and are of grave prognosis. The mortality amongst those cases with positive blood cultures was about fifty-five per cent.; in those where blood cultures were negative about eight per cent. After weighing the evidence for and against, Percy Kidd, in his Lumleian Lectures (1912) considered that a septicaemic origin of lobar pneumonia supplied the best explanation.

Up to the present no one has yet been able to produce lobar pneumonia by intravenous injection of pneumococci; Wadsworth in 1913, Rasquin in 1910, Armstrong in 1914, and Sisson and Walker in 1915, all failed in their attempts to do so. To quote Wadsworth: "Experimental support of haematogenous infection in lobar pneumonia is certainly very meagre, uncorroborated and relatively insignificant. Finally, suffice it to note that, clinically as well as experimentally, pneumonic lesions of the lobar type are uncommon in races or individuals very susceptible to systemic pneumococcus infection, and more common in resistant individuals or species in which systemic infections are less usual." In 1920, Blake and Cecil caused a temporary or persistent septicaemia in monkeys by intravenous or subcutaneous injections of

*Read before the Osler Reporting Society, Montreal, June 1st, 1923.

virulent pneumococci, but no pulmonary lesions resulted. Injected intratracheally, the same cultures caused lobar pneumonia. They conclude that the invasion of the blood stream by the pneumococcus in lobar pneumonia is secondary to infection of the lungs.

Amongst the earliest of those who attempted to produce pneumonia by the injection of pneumococci was Gamaleia in 1888. This was done through the chest wall and caused patchy pneumonia. Intratracheal injections failed at his hands. Bose and Galavielle produced purulent bronchitis, patches of broncho-pneumonia, and, in some instances, lobar pneumonia by intratracheal injection of guinea pigs with virulent cultures of *B. tetragenous*. Wadsworth experimented upon rabbits in 1903, animals very susceptible to infections of the pneumococcus, and showed that intratracheal injections of cultures of very low grade virulence were harmless, those made with very virulent strains caused a total bacteriaemia with no definite pneumonia. On the other hand, if just the right degree of virulence was hit upon for these injections, a small area of central "pneumonitis" resulted. If the rabbits were immunized first and then given intratracheal injections of 1 cc of very virulent pneumococci, the animals did not die of a bacteriaemia, but, on the contrary, the infection was, so to speak, held up in the lungs. None died, but a serious illness lasting 24-36 hours resulted and the animals that were killed on the third or fourth day all showed "acute diffuse pneumonitis"—once involving the whole of one lung and never less than a quarter of one lobe. The immunity had been raised by previous vaccination and the infection confined to the lung.

In 1909, Lamar and Meltzer produced a diffuse evenly distributed lobar pneumonia in dogs by injecting 5 to 10 cc. of a culture of a very virulent pneumococcus by means of a tube thrust down through the larynx as far as the bifurcation of the trachea. One animal died on the third day and besides the pneumonia, fibrino-purulent pleurisy, pericarditis, and septicaemia were found. Nine other dogs were killed on the first to sixth day of disease and none of these had septicaemia. In a further paper (1912) Lamar and Meltzer concluded that for the successful production of pneumonia it was necessary to inject a quantity of culture sufficiently large to obliterate a group of small or even of large bronchi, smaller quantities generally failing to call forth a pulmonary reaction. The pneumonia produced ran a milder and shorter course than in man. Ten cases were fatal and in all but three of these a septicaemia was found. Winternitz and Hirschfelder, using the same method, produced, in 1913, a pneumonia in rabbits. In this, animal blood cultures were positive whenever made. Meltzer reviewed his extensive work in 1914 and showed that he was able to cause lobar pneumonia by tracheal insufflations of the pneumococcus, the pneumobacillus, or the streptococcus mucosus. With the streptococcus, a staphylococcus or influenza bacillus either a bronchial or lobar type of pneumonia was produced, depending upon the amount and virulence of strains used. If pneumococci that were not very virulent were employed no positive blood cultures were obtained in the first forty-eight hours and less fibrin was seen in the pneumonic exudate. If virulent pneumococci were used, blood cultures were positive in the first forty-eight hours, but were consistently negative from the third day on, except in those cases which had a fatal issue. By removing the lower ribs of a dog, Meltzer was able to watch consolidation of the lung develop within four to fifteen hours after insufflation and could hear blowing breathing, etc.

Kline and Winternitz dealt, in 1913, with the question of the importance of leucocytes in experimental pneumonia. Those animals in which a preliminary leucopenia was induced by injections of benzol rapidly succumbed to experimental pneumonia. On the other hand, those that were given toluol repeatedly, or in those where a hyperleucocytosis was caused by repeated injections of nutrose, resistance to pneumonia seemed to be increased.

We come now to the most important work that has yet been done in experimental pneumonia, namely the experiments upon monkeys of Blake and Cecil, the results of which were published in the *Journal of Experimental Medicine* during 1920. Previous work had blazed a trail but it was not detailed enough. The amounts of culture injected were not rigidly controlled, clinical observation of the animal was not minute, and bacteriological study of the animals while living and at autopsy and histological investigation of the tissues were not complete until Blake and Cecil performed their experiments. Again, these two worked with anthropoids and the fact is of the greatest significance for the ultimate aim of all these studies

has always been the eludication of the pathological processes of pneumonia in man himself.

The intratracheal injections were made by thrusting a dry needle directly into the trachea just below the larynx. One cc. of fluid was always used, but the amounts of a virulent culture of an eighteen hour plain broth growth, which it contained, varied from one millionth of a cc. to one cc. The four types of pneumococci were employed in different experiments. Thirty-seven monkeys received injections and all got pneumonia save five. The clinical picture was that of lobar pneumonia in man and Blake and Cecil's charts bear this out in a remarkable way. Rise of temperature began within twelve to sixteen hours; those monkeys that recovered generally showed a typical crisis. In the majority of instances pneumococci were found in the blood stream within six to twenty-four hours after injection, presumably the organisms gained access to the blood vessels from the lymphatics draining the lungs; this supposition receives support from microscopical study of sections of the lung in the earliest stages of experimental pneumonia. This septicaemia was transient in most of the monkeys that recovered. A persistent septicaemia with a rising leucocyte count during the latter part of the disease was nearly always associated with such a complication as empyema or pericarditis. Blake and Cecil made an interesting observation, viz., as a rule the blood cultures ceased to be positive before the crisis, but in other instances they remained positive after the crisis. H. M. Thomas, (Jr.) and Parker, have shown in man that cultures from lung-puncture fluid may be positive or negative just before or just after the crisis. This is a somewhat similar finding to that of Blake and Cecil and it would appear that in the recovery from lobar pneumonia there are two mechanisms, a "bactericidal" and a "detoxifying.

Intratracheal injections of sterile broth, of killed pneumococci, and of living avirulent pneumococci produced no pneumonia. Healthy animals were placed as controls in the same cage as those in which lobar pneumonia was developing but only one showed pneumonia. Spraying of the nose and throat of healthy monkeys with virulent pneumococci caused no pneumonia and no infection of the upper respiratory tract. Therefore, the barrier of the nose and throat must be passed to produce pneumonia, but once the pneumococci reach the trachea (as was consistently shown in the animals that were injected intratracheally) lobar pneumonia is quickly produced in monkeys.

Blake and Cecil also performed experiments upon healthy monkeys using cultures of virulent haemolytic streptococci; the organism is less virulent for monkeys than the pneumococcus so it was found necessary to inject from 0.1 cc. to 10 cc. of an eighteen hour plain broth culture. Only three monkeys died out of the nine monkeys injected intratracheally and these three received streptococci in large doses. These results are not surprising in view of the fact that the *Streptococcus haemolyticus* is rarely virulent enough to cause a primary pneumonia in man and the disease is generally secondary to measles, influenza, etc. Sterile blood cultures from the monkeys throughout the course of the disease were the rule. Lobar pneumonia was never produced but simulated streptococal pneumonia as seen in man. At the most, i.e., following very large doses of streptococci, a widespread confluent lobular pneumonia, accompanied by necrosis, resulted. By using the smallest doses merely an interstitial pneumonia was caused, but with somewhat larger ones the lesion passed from a purely interstitial one to that of a mixed interstitial and lobular pneumonia. Again, as in the case of the pneumococcus, spraying of the nose and mouth of healthy monkeys failed to produce a pneumonia or even an infection of the upper respiratory tract.

Finally, Blake and Cecil were able to produce a pneumonia in monkeys after injections of the *Bacillus influenzae* of Pfeiffer. The strain came originally from an empyema in a child but its virulence was heightened by repeated passage through mice and monkeys. The growth of an agar plate was employed and a bronchopneumonia, like that caused by the same organism in man, was produced in seven out of a total of ten monkeys that received an intratracheal injection. The disease was not fatal, but one case showed pericarditis and septicaemia due to *B. influenzae*. By swabbing the nose and throat with a culture of the organism or by dropping the culture on to the mucous membrane with a pipette an upper respiratory tract infection, similar to a mild influenza in man, was produced; occasionally a tracheo-bronchitis and, in one case, a bronchopneumonia resulted. This monkey showed a sinusitis of the antrum.

We now turn to the pathology of the experimental pneumococcal pneumonias produced by Blake and Cecil in monkeys. Forty autopsies

XUM

were performed, twenty-seven upon animals that had died and thirteen on animals that were killed at various intervals of time after the crisis or on those that were killed on the first to ninth day of disease. In this way it was possible to see the pulmonary lesions at all stages in their evolution.

In three very mild cases, which appeared clinically like abortive attacks of pneumonia, the lungs showed interstitial inflammation only with little or no exudate in the alveoli. The earliest stage, then, was thickening of the vascular adventitia and walls of the bronchi *close to the hilum.* This engorgement extended outwards in the lobe and preceded exudation into the alveoli. The interlobular septa were involved in the same way but to a less extent. The thickening of the interstitial tissues was caused by oedema, leucocytic infiltration, and intense capillary engorgement. Red hepatisation always began close to the hilum of the lung before the interstitial engorgement was completed throughout the lobe, for this was seen in monkeys that died early in the course of the disease. Surrounding those alveoli which showed red hepatisation were those which were oedematous but contained no red cells. In the more distant parts of the lobe, although there was engorgement of the interstitial tissues and of the alveolar walls, the alveoli themselves contained no exudate and not even oedematous fluid. Later on, red hepatisation close to the hilum gave place to grey hepatisation, and red hepatisation appeared at the periphery of the lobe. In the monkey, then, *consolidation is a centrifugal process in all its stages.* The microscope confirmed the naked eye findings, i.e., an interstitial involvement was the first stage and this at first only at the hilum. Sections made at one very early autopsy (three hours after intratracheal injection) showed the pneumococci penetrating the walls of the bronchus at the hilum and thus gaining access to the supporting structure of the lung, the organism were being carried out along the lymphatics and in later stages *could be seen in the walls of alveoli* inside of which there were no organisms or exudate. The exudate of red cells, and later of leucocytes, appeared in the alveoli before it did in the bronchioles. When grey hepatisation was complete throughout the lobe the interstitial tissues and alveolar walls were less congested.

I have dealt at some length upon the stages of the processes leading up to consolidation; most important is the fact that the pneumococci are not borne throughout the lobe along the air passages, but are carried out by the lymphatics.

Complete autopsies were also performed at different stages of the streptococcal pneumonias produced in monkeys by intratracheal injections. The mode of invasion is the same as in the case of the pneumococcus, i.e., through the wall of a large central bronchus into the interstitial tissues and again when infection of the alveoli takes place it is through the alveolar walls. There is a constant tendency, however, for the tissues to form barricades against infection by the streptococcus and unless the infection is very virulent we do not see hepatisation spreading so rapidly throughout the whole lobe as in the case of the pneumococcal infections. In mild cases, although the interstitial engorgement may be pronounced, it is only alveoli close to the bronchi, close to the vessels, to the septa, and to the pleura that contain exudate. Invasion of the cavity of the bronchiole is not primary but follows infection of its walls by lymphatic extension from the hilum. Only when resistance gives way do we find a spreading lobular pneumonia. On account of the barricades thrown up against the streptococcus, extensive damage to the walls of the bronchi and bronchioles results, engorgement and haemorrhage are more marked than in the pneumococcal cases, and even alveolar necroses and small abscesses are formed. These latter are rare in the pneumococcal pneumonias. As a result, on healing or organization with the production of fibrous tissue, more permanent damage is done to the lung in the streptococcal cases.

The morbid anatomy of the pneumonias caused in monkeys by *B. influenzae* differs remarkably from that caused by the pneumococcus and the streptococcus. The disease commences with a tracheo-bronchitis. There is intense engorgement, haemorrhage and oedema, purulent bronchitis, scattered foci of peribronchial consolidation, and, as a result of all this, there is left on healing a patchy emphysema and bronchiectasis. The pathology of this pneumonia is very similar to that seen in nine fatal cases of bronchiolitis and bronchopneumonia occurring before the pandemic of influenza described by the present writer and Dr. Rhea.

As opposed to the pneumococcus and streptococcus, *B. influenzae* of Pfeiffer travels down the bronchial tree into the bronchioles and subsequently involves the alveoli that are contiguous.

In the pneumococcal and streptococcal cases the organisms penetrate the bronchial mucous membrane almost at once and spread rapidly through the perivascular lymph spaces to the alveolar walls and this in all parts of the lobe in the case of the pneumococcus especially. *B. influenzae* are found in large numbers in the alveoli. The lymphatics and interstitial tissues are noticeably free of these organisms as MacCallum pointed out in his study of cases in man, therefore, they are less liable to invade the general circulation.

Finally, I should like to point out that Dr. Howard Mason, of New York, showed, in 1916, by X-ray photographs of lobar pneumonia developing in children, that consolidation begins beneath the pleura and extends in towards the hilum. In his opinion central pneumonia in the strict sense of the term, never occurs, and silent consolidations are subpleural ones and are separated from the hilum by normal lung, and not till consolidation extends inwards are bronchial breath sounds transmitted to the ear. Cecil, in 1920, referred to these observations of Mason but states that in his and Blake's experiments they were never able to demonstrate an infection beginning at the periphery of the lobe. Other workers such as Sieler, Roubier and Caste, of Lyons, and Mouriquand, have demonstrated by the X-rays in cases of lobar pneumonia in adults that the process of consolidation was a centrifugal one.

Insulin Treatment of Post-Operative (Non-Diabetic) Acidosis.—William Thalhimer, Milwaukee, has treated three cases of post-operative acidosis with insulin, causing almost immediate cessation of vomiting and ketosis. The improvement in two cases was quite as rapid and dramatic as is caused by insulin in diabetic coma. In the third case, the improvement was as rapid at first with a small dose of insulin, but the condition rapidly cleared up with larger doses.—*Jour. A. M. A.*, Aug. 4, 1923.

Catharsis in the Treatment of "Colds."—The almost universal use by physicians and laity of laxatives and cathartics in the treatment of acute upper respiratory tract infections (so-called "colds") suggested an investigation to Hugh Macdonald, Evanston, Ill., to determine how large a rôle this therapy played in shortening the duration of these conditions. A mild epidemic of acute respiratory infections furnished an opportunity to investigate this problem among the employees of a large industrial organization in Chicago. In most of the cases under observation there was a more or less generalized infection of the whole upper respiratory tract before the termination of the illness. Information on fifty-one practically consecutive cases occurring during the height of the epidemic was obtained. Thirty-seven persons had used cathartics, mainly at the onset of the illness. The average duration of unemployment of this group was nine days. Fourteen had used no cathartics. Their average duration of unemployment was 7.71 days—14.3 per cent. less than the former group. While it is not claimed that the omission of cathartics will hasten the subsidence of definite symptoms, it is suggested that omission of cathartics in the absence of constipation in the treatment of "colds" does not apparently delay recovery.—*Jour. A. M. A.*, May 12, 1923.

Multiple Tuberculous Bone Lesions Complicating Chronic Pulmonary Tuberculosis.—A case of chronic pulmonary tuberculosis is cited by Joseph Rosenblatt, Wallum Lake, R. I., in which there was metastatic involvement of most of the ribs, the left clavicle, the frontal bone and the thyroid cartilage. The recent literature did not disclose any record of a similar case. One of the most unusual features of this case is the spontaneous fracture of the clavicle. Tuberculosis is hardly ever mentioned as a cause of spontaneous fractures. In this case, however, the involved bones were rarefied and brittle without any gross evidence of new bone formation. It is not surprising, therefore, that the weight of the arm and muscular action were sufficient to break the diseased clavicle.—*Jour. A. M. A.*, July 21, 1923.

XUM

Editorial

RECENT RESEARCH IN THE ETIOLOGY AND PREVENTION OF RICKETS

A VERY valuable research into the causes which underlie the development of rickets has been recently undertaken in Vienna under the auspices of the Medical Research Council of Great Britain and the Lister Institute. Information reached London shortly after the close of the war that rickets was prevalent in Vienna, and the Medical Research Council, which has been carrying on investigations into the etiology of this disease promptly sent a small committee of lady physicians to Vienna to carry on a careful research in association with representatives from the Accessory Food Factors Committee. The report is extremely interesting, detailing one of the most complete studies of human rickets ever undertaken, and presents us with definite knowledge regarding both the etiology and early diagnosis of this disease.

The investigators were fortunate in being able to work in the University Kinder Klinik, under Professor von Pirquet, well known in America, and who at one time held a professorship in Johns Hopkins University. Sixty cots were allotted to them in two separate hospitals under the same conditions of hygiene and an altogether exceptional system of diet control. The investigation consisted in a careful observation of about seventy young infants for periods varying from six months to a year. They were for the greater number babes from the slums and on admission were in poor condition but free from rickets, and were all bottle fed on one of two diets. Diet I consisted of fresh undiluted milk of stall fed cows, sterilized and supplemented by large amounts of cane sugar; after the child was five months old cooked starch in various forms was added. Diet II was a full cream dried milk, reconstituted by the addition of water and in young infants supplemented by the addition of sugar; and after six months by the gradual addition of starchy foods. Experiments on rats showed that both diets had a low value in fat soluble vitamin A, every infant on Diet II received in addition a daily ration of cod liver oil up to one and a half drachms of pure oil given in an emulsion. Thus supplemented, Diet II was notably richer in fat soluble vitamin A than Diet I. Expressed in calories the percentage of the constituents in the two diets varied as follows:

Diet I.—Protein 13, Fat 28, Carbohydrate 59.
Diet II.—Protein 20, Fat 45, Carbohydrate 35.

Thus Diet I had a high carbohydrate and a much lower content of fat and protein. The caloric value of both diets was high: that of Diet I was five to ten per cent. higher than Diet II, owing to the high proportion of cane sugar.

The important facts obtained by this prolonged study was the comparative freedom as indicated by the radiographic plates of the children during the bright summer months from the development of this disease, but in the dark winter months from December to May, seventeen infants, about fifty per cent. of those on Diet I without cod liver oil, developed rickets, and in twelve of these the radiographic diagnosis was made under seven months of age, while the group fed on Diet II with cod liver oil remained free. A further series of observations of breast fed babies under poor hygienic conditions showed that rickets (clinically diagnosed) was common in winter and not rare in summer, and in these cod liver oil was not a perfect prophylactic.

Miss Dalyell and Miss Mackay lay

special emphasis on craniotabes as the earliest sign of developing rickets at least in infants under six months; enlargement of the costochondral junctions, though occurring later between five and six months, was also of value, though confusion here may be caused by physiological or scorbutic enlargement.

The standard of cure was as far as possible radiographic evidence. Spontaneous cure was observed in spring and summer, when babies were much out of doors and on either diet. Diet II containing cod liver oil was curative in winter; while Diet I failed to cure. In winter and spring, babies on Diet I were also cured by cod liver oil or by exposure to sunlight or by the mercury vapour quartz lamp; treatment by sunlight was on the whole, however, more efficacious than the quartz lamp. The imperfect protection afforded by cod liver oil under poor dietetic and hygienic conditions is admitted.

The following factors are emphasized as playing an important part in the etiology of rickets: (1) An organic factor in diet concerned with the calcification of bone; (2) deficiency of sunlight; (3) an inadequate amount or an imperfect balance in the diet of the salts of calcium and phosphorus. Francis Glisson associated rickets nearly 300 years ago with moist and foggy climates, and this appears now as a shrewd guess that hit the very truth. The infant without sufficient exposure to sunlight when fed on either good human or cow's milk has only a narrow margin of safety.

Dr. Dalyell and Dr. Mackay in their description of the clinical signs of rickets imply that cranio-tabes, softening of the outer ends of the occipito-parietal sutures, was the earliest sign and was often observed between three and five months; its persistence indicated that the disease was progressing. In older infants it might be absent, and definite rickets be present elsewhere. Enlargement of the wrists and ankles seldom occurred before the end of the first year and could be detected by radiograph, before it could be verified by clinical observation.

The period of infancy at which rickets develops is, therefore, of clinical importance for at different ages the criteria of diagnosis will change, and the disease will be manifested chiefly in those parts of the bony skeleton which at the time are growing most rapidly. It is evident also that in Vienna, if not elsewhere, rickets may affect infants at an earlier age than has hitherto been recognized.

Von Pirquet in his foreword to the present report states that while previous to these researches of Dr. Harriette Chick and her colleagues he was of the opinion that rickets was of an infectious origin, he has been convinced by the results obtained in their three years of conscientious work, that the disease is definitely associated with a diet poor in fat soluble vitamins, and with absence of sunlight.

INFANTILE MORTALITY AND STERILITY

WE desire to call attention to the facts brought out in the discussion which took place at a meeting of the Section of Obstetrics and Gynaecology of the Royal Society in England, a few months ago, and also at the recent meeting of our own Association. It is a subject in which the profession has much to say, not only as it affects the State but also for its influence on family life, so far as the results of sterility have a bearing on the power and the material and mental effectiveness of a State, the question may perhaps be regarded from a different point of view in England from what it should be in Canada. Voluntary limitation of conception is unfortunately more often made use of by those who

can well afford to have children and educate them well than by those of limited means, who cannot afford to have children and who have not the desire nor the ability to bring them up to be useful to the State. It will be a sad time for any State if the control of the Government passes out of the hands of the educated and patriotic, and into the hands of the ill-educated, self-seeking, and unpatriotic—a result which may be only partly prevented by education, for certainly heredity plays an important part in the after development of the child.

In this problem the profession in Canada must exert their influence to impress upon state authorities and upon responsible individuals that everything which advanced science can do to promote health in those who can or are about to be mothers should be effected; healthy bodies free from disease, sanitary surroundings, proper food, exercise, and, in those who labour, sufficient hours of rest. One of the speakers in England asserted that the percentage of sterility is the index to the morals of a nation. This statement with a certain amount of limitation will by the majority of the profession be regarded as true. In regard to the heavy infant mortality which exists in many cities and districts in Canada there can be but one opinion. It is disastrous and must be controlled. While the profession may do much to effect improvement, the State also should come forward with advice and financial assistance, we desire to emphasize the importance of every School of Medicine in Canada giving more attention to the education of the student in the necessary prenatal care of the mother, and the postnatal care of the infant as well as of the mother. The many problems of infant feeding are not sufficiently taught in the majority of our schools at the present. Paediatrics is one of the most important departments in medical teaching, and the great importance of promoting child welfare should be the aim of every physician and every medical society.

PITUITRIN

JUST about a century ago the ergot of rye, long known on the continent as a remedial agent in the hands of midwives, and later employed in obstetric practice by physicians in France and America, was introduced into England, and in 1828 Mitchell, in a work entitled "On the Ergot of Rye" expressed the opinion that its general introduction would so completely supersede the use of forceps that "it would not be surprising if in twenty years that instrument be known only by name, and again, except in the rare cases in which the Cesarean operation was formerly recommended, he conceived that there would be now no need for instrumental aid in midwifery. Twenty years passed, but Mitchell's prediction was not fulfilled. On the contrary, Ramsbotham, the first secretary of the Obstetrical Society of London, declared that ergot possessed such a strong influence over the uterine system that, if exhibited improperly, it was likely to do great injury. Disproportion between the head and the pelvis, rigidity of the parts—cervix, vagina, or perineum—malpositions of the head, were all contraindications to its use. It might be advisable occasionally in breech presentations, but never in transverse positions, and its sole value lay where the uterine action was feeble.

The present teaching regarding ergot is usually summed up in "Never give ergot until the uterus is empty." Pituitrin seems to be going through the same stages. Probably no drug has had such wide obstetric use as this extract of the pituitary gland. Practically all the claims made for ergot have been made for pituitrin, and it would appear that approximately the same time must elapse

XUM

before the grave danger of its indiscriminate use will be universally manifest.

Let it be remembered that pituitrin is not standardized, that occasionally it may produce no effect, that even with active pituitrin its effect may be evident only after from eight to twenty minutes; but, when it does act, it is more powerful than ergot, more prone to produce tetanic contractions, and the action may be unduly prolonged.

There are on record many reports of rupture of the uterus after even one dose of pituitrin, of extensive damage to the maternal tissues from too rapid expulsion of the child, and, in one instance at least, of the onset of convulsions after the administration of one dose of the drug. The children in many cases, even those born spontaneously, are not infrequently the victims of meningeal and cerebral haemorrhages, convulsions, paralysis, or death.

For the control of bleeding, by causing forcible contractions of the uterine muscles, it is undoubtedly of value in many emergencies, and many of the better obstetricians believe in injecting the incised uterus after removal of the child in Cesarean section, but it is doubtful whether the two large classes of cases, notably those where induction of labour seems indicated, reported by Watson, and those where prophylactic injection at the beginning of the third stage is advocated by Ryder, Brodhead, and Langrock, of New York, might not be as satisfactorily even if not more safely managed by other means. The success of induction of labour by the use of castor oil, quinine, and pituitrin, is not more satisfactory than when castor oil and quinine alone are used, and as to haemorrhage in the third stage it is our belief that the fear of haemorrhage is not the least important factor in its causation.

H. M. L.

Editorial Comment

HELP FOR MEDICAL MEN IN RUSSIA

An earnest effort is being made by the Medical Division of the American Friends Service Committee (Quakers) to collect money, clothing, instruments, books and journals for the benefit of the medical profession in Russia. We are in receipt of a letter from a well known professor in Johns Hopkins University, requesting a personal effort from every physician who has it in his power to aid these *confrères*. He writes that the condition of these men is deplorable. Removed happily to a great extent by the nature of their profession from the political disturbances of the past six years, they have suffered doubly. While the demands for assistance have multiplied greatly, they have been deprived, not only of the bare necessities of life, but are in dire need of drugs, medical and surgical instruments, and of good medical literature. The Quakers assert that they are in a position to assure the American profession that contributions will be promptly and efficiently distributed where it will do most good. The writer ends his persona letter by stating: "It is not a charity; it is a duty." The Quaker relief workers will directly supervise the distribution.

VENEREAL DISEASE

The statement is made by the committee appointed a year ago by the Ministry of Health in England to inquire into and report on the best medical measure for the prevention of venereal disease in civilian communities, that while there is no absolute prevention except continence, and that the success of all medical measures will depend on the cooperation of the community, measures should be taken by the State to diminish all conditions of life which tend to foster promiscuous sexual intercourse, and in this way the spread of disease. With regard to prevention, the committee thinks that a man who, after exposure thoroughly and promptly uses disinfectants runs little risk of infection. In

syphilis, disinfection within an hour would be generally successful, and in gonorrhoea there is prospect of success after a somewhat long interval. It is extremely difficult for a woman to disinfect herself, and the prospect even in skilled hands is more doubtful than in the case of a man. The commercial advertisements of *ad hoc* disinfectants should be prevented, but druggists may be allowed to sell disinfectants approved of by competent authority. Public funds spent in facilities for self-disinfection they regard as less profitable than money spent either on treatment or on measures for the education and improvement of social conditions. The entry of persons into the community suffering from venereal disease should be prevented, the efficient treatment of seamen with venereal disease demands careful thought and perhaps special measures for disinfection.

Methods of Demonstrating the Circulation in General.—Frank Hinman, Duncan M. Morison and R. K. Lee-Brown, San Francisco, describe in detail the celloidin injection method which they use in their work. As an injection method, celluloid corrosion is said to possess these advantages: 1. The gross architecture as well as the minutest ramification of the vascular tree can be demonstrated. 2. Differentiation of structure can be clearly shown by the introduction of a dye. 3. The specimens prepared to show gross structure are not brittle or easily distorted. They are permanent, light and resilient, and can be handled; they are excellent, therefore, for demonstration purposes. 4. The ramifications of vessels, no matter how tortuous or numerous, can be easily traced throughout to their ultimate distributions. The advantages and technique of the dye injection method in duplicating capillary and minute structural conditions, and the value of the barium sulphate stereopticon are also discussed. The authors use a thin suspension of barium sulphate in a 50 per cent. aqueous solution of sodium bromid. Barium sulphate, while not necessary so far as the roentgenography is concerned, is added for two reasons: 1. The degree of capillary injection can be controlled by increasing or decreasing the amount in suspension. Pure solution of sodium bromid passes over too readily into the venous system. 2. By its addition, the progress of the injection can be followed (white suspension), and any leaks in the system at the time of injection readily detected. For the demonstration of the capillary distribution, a 2 per cent. solution of soluble Berlin blue (or soluble Prussion blue, chemically pure) in distilled water is used. The followed advantages are presented by this particular solution: 1. Complete injection of a vascular system to the finest capillaries may be obtained without the slightest diffusion. 2. Its preparation is the simplest possible. 3. The pressure required for complete injection is a minimum. 4. It is chemically inert, having no action on the tissue, such as the coagulation produced by silver nitrate. 5. It is not affected by any of the reagents subsequently employed. 6. Splendid contrast stain may be obtained when employed together with carmin or silver nitrate.—*Jour. A. M. A.*, July 21, 1923.

The Inhalation of Vegetable Dust, Mill Fever. Various forms of hay fever result in large part, at least, from the inhalation of the pollen of plants. Injurious effects are similarly produced by the inhalation of vegetable dust in factories. The vegetable fibres used in the manufacture of clothing are cotton, jute, flax, and hemp. In the preparation of all these fibres and in the mechanical processes necessary to their conversion into cloth more or less dust is produced. Formerly a large percentage of the workers making up these vegetable fibres constantly inhaled the finely divided dust while at work in the factory. Many of the beginners suffered from a low fever known as "mill-fever." Some of them acquired asthma in much the same way that this disease is caused by the inhalation of pollen.—*Hygeia.*

Correspondence

ERYSIPELAS *vs.* CANCER

To the Editor:

The *Canada Lancet and National Hygiene*, in July Number, refers to Professor Roberts, of Edinburgh, and Dr. E. W. Simpson, in regard to a new cure of paralysis of the insane by injecting into a victim of this disease living germs taken from a patient suffering from malaria.

Several years ago a retired lumber merchant, aged about seventy, noticed the slow growth of a tumour on the left side of the face about midway between the eye and ear. There was considerable pain with ulceration and discharge of blood, and pus. He was then living in Buffalo, and consulted a number of physicians but refused any operation. He returned to Toronto, consulted the writer, and as his condition was getting worse he submitted to surgical aid, and at the Western Hospital the morbid mass was removed. The morbid process reappeared in a short time. Patient and physician gave up all hope of a cure. However, some weeks later the patient became infected with a virulent attack of facial erysipelas. The temperature was very high, and there was intense hyperaemia of the face. He recovered in about three weeks and, to the great delight of patient, physician, and nurse, there was not a trace of the former morbid process. The cavity had filled up with normal tissue, and was covered with healthy skin. The patient lived several years without the slightest sign of any return of the morbid process, and died of angina pectoris.

This case presented all the classic "hallmarks" of cancer. All treatment by a number of competent physicians and surgeons was useless but it was completely and permanently cured by an attack of erysipelas. The results obtained from the injection of the living germs of a malarial patient in cases of paralysis of the insane would seem to indicate that the injection of the more virulent germs of erysipelas might destroy the less virulent "aggregation of germs" in cancer.

The cure of this patient through the advent of erysipelas was so prompt and effective that should the writer ever become the victim of cancer—incurable by surgical, and medical methods, he hopes his medical attendant will have "the nerve" to inject living erysipelas germs.

JOHN HUNTER, M.B.

Toronto, Ont., July 25th, 1923.

Fatal Haemorrhage from Eroded Arteria Cystica of the Gall-Bladder.—In the case cited by Richard H. Jaffé, Chicago, two ulcers were present just above the pylorus. One of them was located on the posterior surface. Its floor was formed by the pancreas. The other ulcer involved the lesser curvature and a considerable part of the anterior wall. It entirely penetrated the wall of the stomach. Its base consisted, in the lower part, of liver tissue deprived of the capsule and ulcerated; in the upper part, of the gall-bladder. The wall of the gall-bladder was there changed into a blood-stained ulcer, in the centre of which gaped the lumen of an eroded artery. This proved to be the arteria cystica, a branch of the arteria hepatica.—*Jour. A. M. A.*, May 12, 1923.

Value of Carbon Tetrachlorid as an Anthelmintic.—Several hundred men who had been exposed to hookworm infection previous to imprisonment and who had been in custody for from three months to three years were chosen by J. F. Docherty, Ceylon, to try out various anthelmintics, thymol, chenopodium, betanaphthol and carbon tetrachlorid. Carbon tetrachlorid proved to be the most efficient anthelmintic in 3 c.c. doses. The anthelmintic value of carbon tetrachlorid is practically unaltered by differences in the number of worms harbored. The apparent futility of prolonged treatment was well demonstrated, likewise that a 3 c.c. dose of carbon tetrachlorid does not produce any lesion of the kidney.—*Jour. A. M. A.*, Aug. 11, 1923.

XUM

The Association

REPORT OF THE ANNUAL MEETING OF THE ASSOCIATION HELD AT MONTREAL

June 12th to 14th, 1923

First Meeting of Executive Committee, June 11th

The following members of the Committee were present: Drs. Martin, Reilly, Archibald, Roy, Starr, Secord, MacEachern, Maclean, Routley. On motion duly moved, seconded and carried the minutes of the last meeting of the Executive Committee were taken as read.

It being the purpose of this Executive Committee to receive, consider and prepare the business for the afternoon meeting of the Council, the following *agenda* were taken up *seriatim:*

(1) Reading of Minutes.
(2) Business arising out of Minutes.
(3) Canadian College of Physicians and Surgeons.
(4) Affiliation Canadian Radiological Society.
(5) Lister Memorial.
(6) Code of Ethics.
(7) Insurance Examination Fees.
(8) Canadian Medical Directory.
(9) Bond Issue.
(10) Affiliation of Quebec Medical Association.
(11) Amendments to Constitution—Vancouver, Halfax, Winnipeg, Montreal.
(12) Travelling expenses being deductable for Income Tax Purposes.
(13) *Re* appointment of General Secretary.
(14) Report of the Executive Committee.
(15) Vote of Sympathy—Mrs. Scane.
(16) Invitation to British Medical Association to meet in Canada in 1926.
(17) Minimum Fee for Life Insurance Examinations.
(18) Workmen's Compensation Board Fees.
(19) Income Tax.
(20) Medical Legislation.
(21) Visitation to Provinces.
(22) Report of the Committee on Inter-Provincial Relations.
(23) Report of the Committee on Necrology.
(24) Report of the Committee on Federal Legislation.
(25) Report of the Committee on Education.
(26) Report of the Committee on Constitution and By-laws.
(27) Report of the Treasurer.
(28) Cost of the *Journal.*
(29) Proposed Affiliation with British Medical Association.
(30) *Journal* News Items.
(31) Invitation for the Meeting of 1924.
(32) Provincial License Inspectors.
(33) Fee Splitting.
(34) Courtesy to Medical Missionaries.
(35) Three Governors to the American College of Surgeons.
(36) Financial Advice in *Journal.*
(37) Letter—Toronto Publicity Bureau.

As all items on the above Agenda were disposed of at later meetings of the Executive Committee or Council, we are merely publishing the final decision of the respective body. (*Ed.*)

First Meeting of Council, June 11th, 2 p.m.

The President was in the Chair and the following gentlemen answered to the roll call: Drs. C. F. Martin; T. C. Routley; T. G. Hamilton; E. R. Secord; J. A. MacKenzie; N. J. Maclean, J. S. McEachern; F. N. G. Starr; A. T. Bazin; W. G. Reilly, E. W. Archibald; E. J. Ryan; J. F. Argue; F. W. Marlow, A. Primrose; P. D. Stewart; J. H. Mullin; F. Miller; G. S. Cameron; G. Melvin; J. Roy.

The President having reported to the Council that the Executive Committee had received and considered *seriatim* the clauses on the *agenda* now presented for the attention of the Council, it was decided to again take up the clauses *seriatim* with such report as the Executive Committee had to offer on the various clauses, considered by them. Before this was done, it was duly moved, seconded and carried that the various minutes of the Council be taken as read.

Canadian College of Physicians and Surgeons—Dr. Marlow, Chairman of this Committee reported that no action had been taken by the Committee during the past year, but suggested that the Committee be continued in office in order that the matter might not be dropped. *Dr. Bazin:*—Has the Committee considered the advisability of a Fellowship of the Canadian Medical Association, being formed which might cover the ground and not be too legal? *Dr. Marlow:*—The Committee will be glad to consider this matter at a future date.

Moved, seconded and carried that the Committee be continued in office, that they be asked to ascertain what may be done in the matter.

Affiliation Canadian Radiological Society—Moved, seconded, and approved.

CODE OF ETHICS—The Secretary reported that the *Code of Ethics* had been sent to all members.

INSURANCE EXAMINATION FEES AND MINIMUM FEE FOR LIFE INSURANCE EXAMINATIONS—The Secretary reported that the Companies are unwilling to grant a minimum fee of $5.00 for insurance examinations. Dr. Reilly was of the opinion that we could secure this if medical men would work together.

CANADIAN MEDICAL DIRECTORY—Moved, seconded and carried, that the Directory be not published.

AFFILIATION OF QUEBEC MEDICAL ASSOCIATION—Moved, seconded, and approved.

AMENDMENTS TO CONSTITUTION, VANCOUVER, HALIFAX, WINNIPEG, MONTREAL AND REPORT OF THE COMMITTEE ON CONSTITUTIONS AND BY-LAWS—The Secretary reported the amendments to Constitution which have now been incorporated in the Constitution and By-laws. On behalf of the Committee on Constitution and By-laws, Dr. Melvin submitted the following report:

Your Committee on Constitution and By-laws begs to respectfully recommend as follows:

(1) That Chapter XI—Amendments—third paragraph, be amended as follows: That all of said paragraph after the word "least" be struck out, and the following substituted therefor:—"three months before the annual meeting and shall be published in two consecutive editions of the *Journal* of the Association prior to the annual meeting of the Association. If, or as, adopted, such changes shall be published in the *Journal* of the Association within two months subsequent to the said annual meeting."

The amended paragraph will then read as follows:—"All proposed changes in the By-laws shall be in the hands of the General Secretary at least three months before the annual meeting and shall be published in two consecutive editions of the *Journal* of the Association prior to the annual meeting of the Association. If, or as, adopted such changes shall be published in the *Journal* of the Association within two months subsequent to the said annual meeting."

(2) That, as it appears by the Constitution, Article II, sub-article (*b*) the publication of a periodical *Journal* which shall be the official organ of the Association, is one of the objects for which the Association is established and that such *Journal* has been so established, and as it appears that no provision has been made elsewhere in the Constitution for the editing, control and conduct of such *Journal*, your Committee is of the opinion that due provision should be made in the Constitution for such editing, control and conduct.

To this end, your Committee would respectfully recommend that a special committee of the Association be appointed to take this matter into consideration, said committee to report its findings and recommendations to the Council of the Association in the year 1924.

(Signed) Wm. F. ROBERTS, *Chairman*,
W. H. IRVINE, G. G. MELVIN

Dr. Melvin gave notice of motion that this amendment be adopted.

Dr. Reilly gave notice of motion that in Chap. VII, sec. 6, the last line be changed from "the members of *the* Executive" to "the members of *its* Executive."

TRAVELLING EXPENSES DEDUCTABLE FOR INCOME TAX PURPOSES AND INCOME TAX—Moved, seconded, and carried, that the Secretary be instructed to take the necessary action in this matter by communicating with the Finance Minister.

APPOINTMENT OF OFFICERS—The President announced to the Council that the Executive Committee had made the following appointments: *General Secretary*, Dr. T. C. Routley; *Honorary Treasurer*, Dr. A. T. Bazin; *Editor of the Journal*, Dr. A. D. Blackader; *Managing Editor*, Dr. A. T. Bazin. Moved by Dr. Secord, seconded by Dr. Argue, that this Council approve of the action of the Executive Committee in the foregoing matters. *Carried.*

REPORT OF THE EXECUTIVE COMMITTEE—Your Executive Committee desires to report as follows:

It is with deepest regret that we record the loss by death on May 20th of our late esteemed Secretary-Treasurer, Dr. J. W. Scane. Though confined to hospital and suffering a great deal during his last eight months, he was constantly desirous of rendering what help he could to the Association and his wise counsel and advice were of material assistance to his associates in the carrying on of the work. By his death the Association has lost a valuable officer, the medical profession a worthy representative, and those of us who were privileged to know him, an esteemed and staunch friend. On behalf of the Association, your Executive Committee extends to the bereaved our deepest heartfelt sympathy.

The Associate Secretary has been carrying on the Secretarial work of the Association for the greater part of the year, latterly being appointed by the Executive Committee as Acting General Secretary.

During the past year, three meetings have been held and the routine business dealt with. In addition, a great many matters have been disposed of following conferences between the President, Secretary-Treasurer, and Associate Secretary. Early in the year, committees were appointed and it is expected that some of them will have interesting and constructive reports to present at this time.

Several months ago, a questionnaire was sent out to more than 8,000 doctors in Canada. Its contents will be fairly well known to all of our members. It had to deal largely with questions which had come up at previous meetings. A summary of the replies is herewith appended:

1.—Are you in favour of holding the annual meeting of the C.M.A. only in conjunction with the annual sessions of the respective Provincial Associations? Yes—749. No—409.

2.—If so, in your opinion, should the meeting be one of the C.M.A. in that Province for that year? Yes—612. No—135.

3.—Should the meeting be one of the Provincial Association with the C.M.A. as visitor? Yes—248. No—450.

4.—Are you in favour of the C.M.A. meeting annually independently of and apart from the Provincial Associations? Yes—335. No—407.

—Under like circumstances, biennially?
Yes—180; No—213.

—Under like circumstances, triennially?
Yes—85; No—206.

—Under like circumstances, quadrennially? Yes—45; No—582.

5.—Are you in favour of the publication of an official Canadian Medical Directory? Yes—521. No—591.

6.—Would you purchase a copy at a price not to exceed $5.00. Yes—479. No—607.

7.—Are you in favour of inviting the British Medical Association to meet in Canada in 1926? Yes—1,227. No—28.

8.—Are you in favour of a minimum fee of $5.00 for Life Insurance Examinations? Yes—1,203. No—48.

9.—Do you consider the fees paid by the Workmen's Compensation Board in your Province adequate? Yes—518. No—532.

10.—Do you think $300 per child sufficient abatement on Federal Income Tax? Yes—348. No—796.

11.—If not, what amount do you think fair? 559—$500 (plus).

12.—Have you satisfactory medical legislation in your province? Yes—314. No—551.

In studying the above replies a few observations may be in order. In the ratio of about two to one, the annual meeting of the Association in conjunction with the respective Provincial Associations is favoured, while a very large majority of those replying feel that the respective meetings should be C.M.A. meetings with the provinces acting as hosts. By a small majority, the idea of our meeting annually and independently of the Provincial Associations is not approved. The figures also indicate quite conclusively that meetings less frequent than yearly are not approved.

Opinion being almost evenly divided on the question of an official Medical Directory, your Committee do not now recommend that such a Directory be published.

A most striking unanimity of opinion is expressed in connection with the question reference inviting the British Medical Association to meet in Canada in 1926. Your Executive Committee desires to refer this question to the Council for consideration at the present time.

The minimum fee of $5.00 for Live Insurance Examinations has been almost unanimously approved. There is an almost even division of opinion regarding the adequacy of fees paid by the Workmen's Compensation Boards in the respective Provinces. In the matter of Income Tax, about half of those who replied stated that the deductable sum per dependent child should be at least $500. It would appear that about two out of every three practitioners giving the matter any thought, do not consider the medical legislation in their provinces satisfactory. No doubt all of the matters referred to will supply food for thought and discussion at this time.

During the year, your Associate Secretary has visited the Provincial Medical Associations of Saskatchewan, Nova Scotia, and Manitoba. At all of these meetings, a cordial reception was given to him and the aims and ambitions of the Association were received with every indication of being heartily approved.

Throughout the year, the Provincial Associations have been kept informed in regard to matters of national import, and at least a start has been made in laying down lines of communication which it is hoped will be perfected, whereby the whole of Canada will be linked up under the banner of a very strong national organization.

Our financial statement will not only show a very creditable balance for the last year's operations, but will also explain in detail our membership, present financial standing, etc., which is herein detailed.

Arrangements have been completed for Dr. F. J. Tees, Montreal; Dr. F. W. Marlow, Toronto; and the Secretary, to visit the four western provinces during the coming summer. Meetings will be addressed by these gentlemen as follows: Victoria, July 3rd; Vancouver, July 5th; Calgary, July 9th; Edmonton, July 12th; Saskatoon, July 13th; Regina, July 14th; Winnipeg, July 16th; Port Arthur, July 17th. This is the first time that under the auspices of the Association such a tour will have beenmade.

The Secretary has been invited and will attend the American Medical Association meeting in San Francisco as an official delegate from the Canadian Medical Association. At this meeting an opportunity will be afforded the Secretary to secure first hand information regarding the organization and methods of the American Medical Association. In addition he will give an address on graduate instruction for physicians in general practice.

In concluding, your Executive Committee, while feeling that there is ground for gratification for the progress made during the past year, expresses the hope that the coming year may show a greater desire for cooperation on the part of the profession generally. A great privilege, a real opportunity, is presented to all of us who sincerely wish to see the medical profession of this country solidly united.

Our Committee on Interprovincial Relations not only visualizes the possibilities of unity but points out in a very practical manner how we as a profession and also the public whom we serve may greatly benefit by our getting together under the banner of our national medical organization.

May our watchwords for the coming year be Organization, Progress, and Service.

All of which is respectfully submitted.

T. C. ROUTLEY, *Acting General Secretary.*

Moved, seconded, and carried, that the report be received and adopted.

Report of The Treasurer

The report which your Committee has the honour to present shows a marked improvement in the finances of the Association over las year. Whereas on December 31st, 1921, we had a bank overdraft of close to $3,000.00 at the end of the calendar year 1922, we showed a surplus revenue of $6,736.24. Receipts from subscriptions in 1922 amounted to $16,684.82 as compared to $13,554.49 in 1921. Taking into consideration the fact that in January, 1922, the annual fee was raised to $10.00, the increase over 1921 might not be considered sufficient. It must, however, be borne in mind that the decision of the Council at Halifax whereby all subscriptions became payable on January 1st, necessitated the collection of fees on a *pro rata* basis. The full ten dollar fee was, therefore, received from only about sixty per cent of our members. In addition, over 500 dropped their membership. It is of interest to note that the reason for resignation given by the large majority was the excessive fee charged by the Provincial Associations which, it was the contention, made it impossible to carry on membership in both organizations. New members added to the books numbered 291.

Receipts from advertising amounted to $16,860.02, showing an increase over 1921 of $5,633.71. Although this is an excellent showing and more than paid for the actual printing of the *Journal*, it was not sufficient to cover all additional expenses connected with the *Journal*, such as Agents' commission, the cost of illustrations and the allowance to the Editorial Board. Towards the end of 1922 a reluctance on the part of new advertising firms to take space in our *Journal* was noticeable. Investigation showing this to be due to our high charges for advertising and to a comparatively small circulation, your Committee considered an immediate remedy advisable. Consequently, commencing January, 1923, the advertising rates were lowered from ten per cent. to twenty per cent. The question of circulation, however, was a more serious one, and after due consideration, a proposition from the President of the Ontario Medical Association was approved and accepted. This, in short, was to the effect that the *Journal* should be sent free for one year to about 1,000 members of the Ontario Medical Association, who are not members of the Canadian Medical Association, the cost to be borne equally by the Canadian

and Ontario Medical Associations. In sending the *Journal* free to these doctors, it is not only our object to obtain a large circulation, but to stimulate interest in the *Journal* and the Association. To this end the Secretary is keeping in touch with all who are receiving the *Journal* under this arrangement. It is hoped that by the end of the year, the large majority will become permanent members of the Association. The same proposition was made to all other Provinces, but only the Manitoba Medical Association found it convenient to enter into the arrangement. The cost of these additional thousand copies is small, averaging about $120.00 per month.

Your Committee has pleasure in stating that the lowering of the advertising rates and the larger mailing list has enabled us to obtain a number of new contracts since the beginning of the year, and, with few exceptions, retain those previously on our books.

Speaking to the Treasurer's Report, the following points were noted: Dr. Cameron suggested that the possibility of publishing the *Journal* oftener than once a month be considered. Dr. Martin pointed out two discouraging factors, one, the great expense, second, the securing of proper material. Moved, seconded and carried that the report be adopted.

Moved, seconded and carried that the Editorial allowance be increased from $1,500 to $2,000.

In connection with the Treasurer's report, it was moved, seconded and carried, that the recommendation of the Executive Committee *re* the redemption of $2,000 worth of Bonds and the placing of $2,000 in a sinking Fund be approved. (For Auditor's Statement see p. 690).

VOTE OF SYMPATHY—MRS. SCANE—Moved, seconded, and approved.

WORKMEN'S COMPENSATION BOARD FEES—Council felt that the Association should assist the Provinces in this matter. In this connection it was moved, seconded and carried that "whereas it becomes necessary at times for a Workmen's Compensation Board patient to travel to his own Province, that the incoming Executive Committee be instructed to take up with the Workmen's Compensation Board in each Province the matter of reciprocity in this connection."

VISITS TO PROVINCES—The President warmly thanked Drs. Marlow and Tees for the generous spirit they had shown in being willing to visit the West in the interests of the Association. Dr. McEachern assured the gentlemen of a hearty welcome in Calgary.

Dr. Blackader, who then came into the meeting, was accorded the privilege of discussing *Journal* matters. The Editor pointed out some of the difficulties encountered in conducting the publication and upon resuming his seat was assured by the President, and members of the Council, of appreciation of his work.

It was moved, seconded, and carried, that the appointment of Dr. Blackader as Editor of the *Journal* be heartily approved.

REPORT OF THE COMMITTEE ON INTER-PROVINCIAL RELATIONS—Moved, seconded, and carried, that the Report be taken as read. (A summary of this report will be found in the July issue, p. 525.)

REPORT OF THE COMMITTEE ON NECROLOGY—Moved, seconded, and carried, that the report be taken as read.

REPORT OF THE COMMITTEE ON FEDERAL LEGISLATION—Your Committee on Legislation begs to submit the following report:

(1) In Great Britain, the Universitites are privileged to select University representatives to parliament. Would it be in the best interests of our country that a like situation be established here? Would the presence in our parliament of learned men, carrying with them the weight and influence of the academic centres they would represent, contribute to constructive administration in our national affairs? Your Committee would recommend this matter for your serious consideration and discussion.

(2) In combatting the drug evil in our country, our Federal Department of Health shows that considerable progress has been made during the past three years. Your Committee would strongly urge that in a national way, and also acting through the respective provinces, every possible assistance be brought to bear to further cope with this great menace.

(3) Your Committee further note with satisfaction that, during the past three years registered patent medicines in Canada have been cut down from 60,000 to 6,000. This is a matter upon which the profession may look with some satisfaction, and your Committee would urge that every possible assistance be rendered the federal authorities in carrying on their work in this connection.

(4) There is a deplorable lack of accommodation in our Dominion for those poor unfortunates amongst us who become drug addicts. The Association is urged to throw its full weight and influence into any plan which may be evolved calculated to provide proper institutional care for these people. If it be a matter for the respective provinces to deal with provincially, then the Association should get behind each provincial Association which may undertake the work.

Without comment, your Committee passes on for the consideration of the Association the following queries:

(*a*) Should the degree to practise medicine from our Canadian universities fulfil all requirements to practise, without a further licensing examination at the hands of the Councils of the respective provinces?

(*b*) Should we not in Canada endeavour to arrive at a more or less generally accepted idea of what is to constitute proper pre-medical education, and also proper scientific education?

(*c*) Is there a growing tendency to unduly increase the period of attendance in the study of medicine, this now being six and in some centres being mooted as a seven year course? Will such lengthening of the course tend to keep out of the profession, for financial reasons, many men who would otherwise make very successful practitioners?

(*d*) If it is desirable that Council examinations for our own graduates should continue, would it be advisable for the various provinces to unite in such a manner as would do away with provincial Council examinations, making use of the Dominion Medical Council for this purpose?

XUM

Your Committee are strongly of the opinion that the Association through this Federal Committee on Legislation should act as a clearing house for the entire Dominion in matters of medical education and legislation. For proper and efficient organization, each province should appoint a representative to this Committee, and be responsible for his attendance at the necessary meetings. These provincial representatives in turn would be Chairmen of their provincial Legislative Committees, thus setting up the necessary lines of communication. By such organization, your central Committee should be kept thoroughly informed as to the exact state of medical legislation in the respective provinces, so that, the full weight and influence of this knowledge could be brought into play in any one particular province, upon call. At the same time, your central Committee could disseminate to each province from time to time, exactly what was being done by the various provinces. Not only would this make for better medical legislation in each province, but it, in time, should bring about such a uniformity of medical legislation as would be in the best interest of the public and practitioners of medicine throughout our country.

Your Committee would most strongly present the point of view that proper medical legislation must be approached from two distinct angles:

(1) By rigidly adhering to all standards which will produce capable practitioners.

(2) By educating the public to a full realization of what constitutes ability and capability to render proper service in health matters.

If these two ideas are ever kept to the front, progress along the desired lines must ensue. Particularly would we stress the advisability of making the public thoroughly conversant along the lines suggested. We believe that the standards of education within the profession are commendably satisfactory.

Your Committee would strongly urge upon the Association that they take the initiative in bringing about a national conference on medical education and legislation. It is suggested that representatives of the Canadian Medical Association, Canadian Medical Council, Provincial Colleges of Physicians and Surgeons, Provincial Medical Associations, Federal Department of Health, Provincial Departments of Health, Medical Faculties of the various universitites, and such other bodies as might possibly be subsequently suggested, get together, say this coming winter, and hold a three day session for the purpose of presenting and discussing the many problems allied to medical education and legislation, which will doubtless suggest themselves to each one of you. Such a conference has already become a permanent annual feature in the United States. Your serious and sympathetic consideration of this recommendation is solicited.

Your Committee would respectfully suggest that the name of this Committee be changed from the "Committee on Federal Legislation" to the "Committee in Charge of the Legislative Bureau of the Canadian Medical Association."

All of which is respectfully submitted.

J. H. MULLIN, *Chairman*.

Moved, seconded, and carried, that the report be received and approved. Dr. Melvin, speaking of the report, stated that much of this is education and not legislation.

Dr. Martin thinks Dr. Mullin's report an excellent one and that we should hear from Dr. Maclean before disposing of Dr. Mullin's report.

Report of the Committee on Education

The Committee has considered medical education from the standpoint of: (1) Pre-medical standards. (2) Undergraduate training. (3) Post-graduate teaching. (4) Education of the public.

Into the details of the work of medical schools such a report cannot very well enter. These are matters complex and technical. But about the general drift of education and what it is accomplishing, its strong points, and its weaknesses, its right tendencies and wrong tendencies, and its adaption to the needs of students, practitioners, and the people at large, about these things the members of the Association scattered widely throughout the Dominion and representing all circumstances of practice can speak, and upon this they should be heard.

In considering pre-medical standards the question arises as to whether the educational test of a matriculation examination, or even a degree in arts is sufficient guarantee that the candidate is eligible for training for the medical profession.

There is a great difference in what constitutes the pre-medical course. Most of the Canadian universities accept as qualification, the junior matriculation. Their medical course is, therefore, extended to six and even seven years. The University of Manitoba, on the other hand, requires after the junior matriculation, that the candidate take a two year pre-medical course, being practically the first two years of the science course, with Latin as a compulsory subject. Most of the subjects embodied in this pre-medical course, are in other universitites, included in the first two medical years. The subjects considered pre-medical are: chemistry, physics, zoology, botany, Latin and one of the modern languages.

In the case of a candidate with the higher degree, (B.A.,M.A. or B.Sc.) the question as to fitness should be exceptional, provided he has taken the necessary elementary sciences. Until very recently, a graduate in Arts, irrespective of the subjects taken, was admitted without question to the medical college, and allowed one year on his medical course. At present, a graduate in Arts, unless he has taken the requisite science subjects, is not admitted directly into the medical department. For example, a graduate in Philosophy of the University of Manitoba is at the present time reverting back, and taking two pre-medical years. This, added to the five years medical work, will make eleven years of university study before he receives his degree in medicine. Had this student arranged his course so as to include the necessary fundamental sciences, it would have saved him two years.

To encourage a prospective candidate to take three years pre-medical work, it has been suggested that the University grant the degree of B.A. after the completion of his first medical year. At the present time, a combined course is arranged in the University of Manitoba of eight years, (*i.e.*, three pre-medical and five medical) in which a student receives the degrees of B.Sc., M.D. The B.Sc. is conferred at the completion of the first medical year. A somewhat similar arrangement obtains in the University of Toronto, where the candidate receives a B.Sc. in Medicine and a M.B.

It is true, however, that in all schools a few students arrive at their final year who should never have gotten beyond their primary examinations. The University of Minnesota, in addition to educational requirements, and birth within the State, requires that the candidate appear before a board for final admission. It is interesting to note in this connection, that Harvard University has adopted the "wide open door" principle, the only test required being an educational one. The question of an educational test alone is a debatable one, and it is suggested that this committee in reporting further on pre-medical requirements, consider the following points: (1) Physical requirements. (2) Moral standing. (3) Mental efficiency tests.

Under-graduate Training.—The medical student enters the university to acquire a working knowledge of the fundamental medical sciences—anatomy, physiology, biochemistry, and a sufficient knowledge and experience in clinical methods of diagnosis and treatment, in order to fit him for special service to the community. This course requires consideration from two angles, the curriculum and the teacher.

The curriculum is being constantly revised to keep pace with the requirements of the ever changing ideas and ideals of medical thought and knowledge. Dr. E.

Stanley Ryerson, Secretary of the Faculty of Medicine of the University of Toronto, has made a valuable contribution to medical education in his insistence upon an arrangement of the curriculum, correlating the fundamental medical sciences with pathology and clinical teaching.

Under the old system the student, not infrequently when he has reached his graduation exercises seems to have forgotten the essentials of anatomy and physiology, learned in his first two years. Those who have had the experience of passing candidates at their final examination, or at the Dominion Council have observed imperfection in training in clinical methods and diagnosis. At a recent examination, a candidate who knew his theoretical work well, and had read extensively, even quoting from the *Archives of Surgery*, did not seem to know how to proceed in the diagnosis of a case, and could not demonstrate the presence of fluid in a knee joint. It is even possible for students during their course, to spend too much time in the medical library, if they thus exalt theoretical knowledge over practical, and cut down the time for the study of clinical methods, and clinical diagnosis, and their practical application at the bed-side.

The clinical teaching of the student when he enters upon his hospital work is left too much to the senior clinician in charge of the ward. The beginner requires to be taught normal structure and normal function side by side with the abnormal. His powers of observation should be trained, and he should be taught correct methods of examination. Clinical reasoning will thus become stimulated, and he will be able to think with greater accuracy, and arrive at more exact conclusions. This teaching, especially to the student, who is beginning his clinical work can be much better done by the younger men, who are developing along special lines. The method, which obtains in British hospitals, of appointing medical and surgical registrars, who have access to the clinical material, and whose work is a stepping-stone to appointments on the active staff, works out well for both teacher and student.

The purpose of our medical schools is primarily to train general practitioners, and not specialists in any particular line, and this should be borne in mind by the teachers in the different sections.

Considering further the teaching of under-graduates, let us draw two columns, first, "What do we give the student," and second, "What does he need in actual practice?" It will certainly be agreed upon that these columns do not balance, and we do not think they should, but we must not allow ourselves to lose sight of the practical side of medical education. It is the experience of most graduates, who take up rural practices away from the facilities under which they were taught, to find that not an inconsiderable portion of their learning is inapplicable to their new found practice. We cannot blame them, should they feel discouraged and dissatisfied. In short, the country practitioner finds that he is forced to reconstruct a system of medicine all his own. Here is where individual resourcefulness comes, and this is very largely a personal factor.

Post-graduate Teaching.—One of the greatest problems in medical education is that of keeping the man efficient for the highest quality of service after he has said good-bye to his Alma Mater. The average graduate feels that when his degree has been conferred upon him, the interest of the University in his career ceases. A number ofthe provincial associations, particularly the Manitoba Medical Association, and the Ontario Medical Association have done excellent work in bridging over this *hiatus* between the practitioners of the outlying country districts, and the teachers of the larger centres.

Post-graduate courses are now given by the University of Manitoba, and by the University of Toronto. These are first class, but it is not always possible for the man in the country to leave his practice, just at the set time these courses are given. It would be a step forward if the universities would undertake, in addition to their regular post-graduate course, to provide instruction in any subject or subjects, to one or more practitioners at any time during the teaching session.

In the granting of the C.M. degree, the University of Manitoba has taken a very advanced stand. This degree is not conferred until at least three years after graduation in medicine and requires that the candidate devote three years to special study and practical work in surgery. At the end of this time, he is required to pass a special examination in both theoretical and practical surgery. This is the only qualification obtainable in Canada for special post-graduate work. This might well be adopted by other Canadian universities and the principle even extended to other specialties.

Education of the Public.—The time has come when one of the responsibilities of the organized medical profession is the teaching of medical facts to the general public. We all know that diagnosis is more difficult in the early stages than in the later stages of disease, yet our system leaves to a large extent early diagnosis to the untrained, perhaps ignorant, ordinary citizen and brings late diagnosis only to the physician. About most diseases we complain and again complain that they come to us too late. How can we expect them to come earlier since the appreciation of illness by the ignorant and untrained patient has to be very definite before he will think of the extreme step of seeing a doctor? In a way, the doctor is consulted as a court of last resort when the patient and his friends have failed, and very often the doctor begins to exercise his function when the case has been pretty well botched and the disease far advanced.

In some of the provinces it has become the rule that every medical convention shall have one meeting for the public instruction. It would be well for every provincial organization from the Atlantic to the Pacific to adopt this as part of their programme. The American Medical Association after long consideration has brought out a Journal, *Hygeia*, as a medium of instruction for the general public. The Modern Hospital Publishing Company has the *Nation's Health*, a magazine along similar lines. There is much material published by various agencies throughout Canada, that might be made valuable for the instruction of the public in general along the lines of health. The public press could be more utilized than it is, popular lectures should be given at the universities, and broadcasting could be used to great advantage.

Since preventive medicine and the teaching of the public is a definite part of the medical work of to-morrow, why should it not be considered in the training of medical students? This is very different from the training in the way of "selling their goods" given to the student of the irregular cults. But since error can be overcome only by truth, why not help our medical men to wing their words. The Western University has a faculty of public health. The University of Toronto has a medical man lecturing on medical themes to its non-medical students. The University of Minnesota has a department of preventive medicine and public health. Some are afraid of the strain the work of publicity might put upon medical ethics. If the old bottles cannot stand the new wine, then let us have new bottles.

N. J. MacLEAN, *Chairman*

It was moved, seconded and carried that the Report of the Committee on Education be adopted, and that it be referred to the incoming Executive Committee, for the necessary action.

Moved, seconded and carried, that the incoming Executive Committee be empowered to arrange for a medical Conference as outlined, and it is in their opinion expedient so to do.

INVITATION FOR THE MEETING OF 1924—Dr. Argue, speaking to the invitation from the Ottawa Medico-Chirurgical Society, heartily invites the Association to meet in Ottawa in 1924.

Moved, seconded, and carried, that Dr. J. F. Kidd, of Ottawa, be nominated as President for the year 1923-1924.

XUM

MOTOR MARKERS—Moved, seconded, and carried, that the incoming Executive Committee be instructed to study the question of securing motor markers for the profession, of a proper design, and something of a permanent nature.

GROUP INSURANCE—Dr. Mullin, speaking on this question, felt that as medical men we should have lower rates. It was therefore moved, seconded, and carried, that the problem of group insurance of all types be referred to the incoming Executive Committee, to be studied upon and reported next year.

MEMBERS OF COUNCIL—Members of Council who by lot go off the Board at this time, the lots being drawn for by the President: K. A. MacKenzie, of Halifax; J. S. McEachern, of Calgary; J. G. McDougall, of Halifax; W. S. Galbraith, of Lethbridge; A. W. Munro, of Edmonton.

ATTENDANCE OF COUNCIL MEETING—Dr. Mullin stated that some action should be taken to impress upon members of the Council the duty they owe the Association to attend meetings of the Council.

AMENDMENT OF BY-LAWS—Notice of Motion by Dr. Mullin *re* By-laws and Committee Report that clause read "Two months, and that all reports be printed for presentation to Council and the Association."

Dr. Routley gave notice of motion that the Constitution be amended to provide that Chairmen of standing and special committees of the Association become members of the Council.

There being no further business, the meeting adjourned at 6:20 p.m.

SECOND MEETING OF COUNCIL, JUNE 12th, 5 P.M.

With the following members present: Drs. Martin, Ryan, Secord, Argue, Bazin, Reilly, Hamilton, Maclean, McEachern, Stewart, Archibald, Rankin and Routley.

APPOINTMENT OF EXECUTIVE COMMITTEE—The President-elect instructed the Secretary to announce that he had appointed Dr. W. G. Reilly, of Montreal, Chairman of the Executive Committee. In addition to Dr. Reilly, the following six members of Council were duly nominated and appointed to the Executive Committee: F. N. G. Starr, Toronto; E. R. Secord, Brantford; T. G. Hamilton, Winnipeg; J. H. Mullin, Hamilton; J. S. McEachern, Calgary; E. W. Archibald, Montreal.

LISTER MEMORIAL LECTURES—Moved, seconded, and carried.

(1) That the Lister Memorial Lecture be made an institution of the Association.
(2) That the first Lister Memorial Lecture be presented at the annual meeting in Ottawa, in 1924, and that Dr. John Stewart, of Halifax, be asked to give this lecture.
(3) That the Lister Memorial Lecture be given every three years.
(4) That the Executive Committee study the question of ways and means in connection with the expenses pertaining to the giving of the Lister oration, and that further, the Executive Committee consult with the Lister Memorial Committee on this point. (See also p. 690).

ASSIGNMENT OF CHAIRMEN OF COMMITTEES—The following were duly nominated and elected by the Council: *Necrology*, H. B. Small, Ottawa; *Education*, Neil J. Maclean, Winnipeg; *Committee in Charge of Legislative Bureau*, J. H. Mullin, Hamilton; *Constitution and By-laws*, W. G. Rankin, Woodstock, N.B.; *Interprovincial Relations*, Malcolm MacEachern, Ottawa.

It was further decided that Dr. Mullin's Committee should take under advisement the matter of Group Insurance, and also the question of suitable permanent Motor Markers.

There being no further business, the Council adjourned to reconvene again immediately at the close of luncheon on Wednesday, June 13th.

THIRD MEETING OF COUNCIL, JUNE 13, 2.00 P.M.

The President, Dr. Martin was in the Chair. Thirteen members of the Council were present.

REPORT OF INTERPROVINCIAL RELATIONS COMMITTEE—Moved, seconded, and carried, that the report be adopted.

CONDUCT OF BUSINESS—Moved, seconded, and carried, that all business conducted by Council, and all unfinished business of Council requring attention, be passed to the incoming Executive Committee for the necessary action.

INVITING BRITISH MEDICAL ASSOCIATION TO CANADA—After some considerable discussion on this point, in which it was pointed out that twenty-four Manitoba members present had sent a telegram to Winnipeg asking that instructions be forwarded to this meeting permitting the Winnipeg men to urge that the British Medical Association be invited to meet in Winnipeg. It was moved, seconded, and carried, that if Winnipeg decided to have the British Medical Association hold its annual meeting in conjunc-

tion with the Canadian Medical Association in that city in 1926 or 1927, that this Council recommend to the Association that such invitation be extended to the British Medical Association on behalf of this Association, and the Medical Association of the city of Winnipeg. (See also p. 690)

There being no further business the meeting adjourned at 2:30 p.m.

SECOND MEETING OF EXECUTIVE COMMITTEE, JUNE 13th, 2.30 P.M.

The Chair was taken by the President-elect, Dr. J. F. Kidd, who, after extending greetings to the members of the Executive Committee, called upon Dr. W. G. Reilly, of Montreal, Chairman-elect of the Executive Committee, to take the Chair.

DATE OF 1924 ANNUAL MEETING—Moved, seconded, and carried, that Drs. Argue and Kidd, of Ottawa, acting in conjunction with their Executive Committee, arrange the dates of the next annual meeting.

REDEMPTION OF BONDS—Moved, seconded, and carried, that the Treasurer be instructed to arrange for the redemption of twenty bonds by lot on the next interest date, which is October 1st, 1923.

MEDICAL CONFERENCE—Moved, seconded, and carried, that the Committee on Education, the Bureau of Legislation, and the Interprovincial Relations Committee, be instructed to study this matter, and to submit their findings and suggestions to the Executive Committee not later than November 1st, 1923.

AFFILIATION WITH BRITISH MEDICAL ASSOCIATION—Moved, seconded, and carried, that the Secretary be instructed to correspond with the Secretary of the British Medical Association regarding a basis of affiliation, and that copies of the correspondence, both written and received, be forwarded to each member of the Executive Committee.

In this connection the following points were noted: That the British Association is apparently in favour of affiliation without any expense to us. We do not wish to lose our identity and would prefer affiliation on a basis similar to that enjoyed by the Canadian Radiological Society and the Canadian Society of Anaesthetists with us.

APPOINTMENT OF LICENSE INSPECTORS—Moved, seconded, and carried, that the Legislative Bureau be instructed to study and report upon this matter not later than November 1st, 1923; and that Dr. Hamilton, of Winnipeg, be requested to place his findings on the matter in writing before the Committee at the earliest possible date.

Canadian Medical Association Journal to CANADIAN MEDICAL MISSIONARIES—Moved, seconded, and carried, that the Secretary be instructed to procure from the Churches in Canada the necessary information as to the number of missionaries which are in foreign fields, and the expense entailed in sending the *Journal* to this number.

THREE GOVERNORS TO AMERICAN COLLEGE OF SURGEONS—After considerable discussion on this subject, both *pro* and *con* it was moved, seconded, and carried that Drs. Van Wart, of Fredericton, Archibald, of Montreal, and F. N. G. Starr, of Toronto, be appointed Governors to the American College of Surgeons.

GROUP COVERING IN THE CANADIAN MEDICAL PROTECTIVE ASSOCIATION—Moved, seconded, and carried, that our Treasurer be instructed to take this matter up with the Canadian Medical Protective Association and be in a position to report back to this Committee not later than November 1st, 1923.

TESTIMONIALS—Moved, seconded, and carried, that the Secretary be instructed to prepare and forward resolutions of appreciation and congratulations from this Association to Drs. Banting, Best, Collip and Macleod for services rendered in connection with the discovery, preparation and application of insulin. Later, the following resolution was sent:

"That the Canadian Medical Association desires to record and express to Drs. Banting, Macleod, Collip and Mr. Best sincere appreciation for the production of insulin; and further desires to urge upon the Federal Government that suitable recognition be granted these gentlemen for the services rendered humanity."

RESOLUTION TO FEDERAL GOVERNMENT—Moved, seconded, and carried, that copies of this resolution embodying the names of the four gentlemen mentioned be sent to the Federal Government urging that these gentlemen be suitably recognized.

TRAVELLING EXPENSES OF EXECUTIVE MEMBERS TO EXECUTIVE MEETINGS—Moved, seconded, and carried, that members of the Executive Committee be instructed to keep account of expenses entailed in attending meetings of the Executive Committee; such memorandum to be

XUM

placed in the hands of our Treasurer at the time of our next annual meeting.

LISTER MEMORIAL LECTURE EXPENSE—Moved, seconded, and carried that the Lister Memorial Committee inquire into the matter of expense connected with the preparation and presentation of the Lister Memorial Lecture. This information to be placed in the hands of the Treasurer, not later than November 1st, 1923.

Note.—The Committee unanimously agreed that such communication should go to Dr. Starr, member of the Lister Memorial Committee, Dr. Starr agreeing to obtain the necessary information. (See also p. 688).

SECTION OF DERMATOLOGY AT ANNUAL MEETING—Moved, seconded, and carried that this communication be referred to Drs. Kidd and Argue, of Ottawa, for their consideration and decision.

Note.—Several members of the Committee present objected to the creation of a number of small sections in the Association as they were heartily in favour of more open general sessions.

It was agreed by the Executive Committee that the next meeting would be at the call of the Chairman sometime after November 1st, 1923. The Secretary urged upon each member of the Executive Committee the advisability of co-operation.

Dr. Starr urged upon the Executive Committee of getting their wives properly informed on items of interest whereby the influence of the wives of the doctors could be properly directed when questions affecting the practice of medicine arose.

There being no further business the meeting adjourned at 3.30 p.m.

THIRD MEETING EXECUTIVE COMMITTEE JUNE 14TH,

Present Drs. Kidd, Reilly, Bazin, Hamilton, Stewart, Martin. The meeting was called to deal more particularly with the invitation of the medical profession of Winnipeg to the British Medical Association to meet in their city during 1926 or 1927.

The following is a report of the Special Committee Appointed to consider the matter:

"It is unanimously the opinion of the Committee that an invitation should be extended to the British Medical Association to meet in Winnipeg in conjunction with the Canadian Medical Association, and that the Executive shall by correspondence with the British Medical Association decide as to whether the date shall be 1926 or 1927."

It was unanimously agreed that Winnipeg should be allowed to extend the invitation and that further arrangements should be conducted by means of correspondence between the Executive of the Canadian Medical Association and that of the British Medical Association. (See also p. 689).

AUDITOR'S REPORT

Dr. J. W. Scane,
Secretary-Treasurer,
Canadian Medical Association,
Montreal.

Dear Sir:—We beg to report that we have written up and audited the Books and Accounts of the Association for the year ended 31st December, 1922, and attach hereto Balance Sheet as at that date, together with statement of Revenue and Expenditure for the period under review.

The excess of Revenue over Expenditure for the year, after including all known liabilities amounting to $6,736.24, has been transferred to the deficit account, which it reduces to $9,827.27 as shown by the Balance Sheet. We consider it advisable that all Excess Revenue be devoted to the reduction of the Deficit Account until such a time as that account is wiped out. As regards further Excess Revenue, consideration should be given to the question of the redemption of the bonds, which mature in October, 1931.

The Books were in good order, every assistance was given us in carrying out our work and our requirements as Auditors have been fully complied with.

Yours very truly,
McDONALD, CURRIE & CO.,
Auditors.

Montreal, January 10th, 1923

CANADIAN MEDICAL ASSOCIATION

Balance Sheet as at December 31st, 1922

ASSETS

Cash on hand	$ 25.00	
Cash in Bank—Current Account	4,769.91	
Cash in Bank—Savings	1,729.64	
		$ 6,524.55
Accounts Receivable:		
Advertising	$ 1,803.22	
Reprints and Illustrations	261.22	
		2,064.44
Investments:		
Ritz-Carlton Hotel 5% Bond		1,000.00
Furniture and Fixtures		25.23
Deficit Account:		
Balance on opening books—1st. January, 1922	$16,563.51	
Deduct—Surplus Revenue for year as per statement of Revenue and Expenditure	6,736.24	
		9,827.27
		$19,441.49

LIABILITIES

Accounts Payable	$1,884.49	
Bond Interest accrued	195.00	
		$ 2,079.49
Prepaid Subscriptions—year 1923		762.00
Bonds—5% Due 1st October, 1931—Authorized $20,000.00		
Issued and Outstanding		15,600.00
Surplus—Special Donation Received (*contra*)		1,000.00
		$19,441.49

CANADIAN MEDICAL ASSOCIATION

Statement of Revenue and Expenditure for Year Ended 31st December, 1922

By Total Subscriptions—Doctors, Libraries, etc.	$16,684.82		
Advertisements	16,860.02		
Sundry Sales of *Journal*	376.59		
		$33,921.43	
To *Journal Expenses:*			
Printing	$15,936.60		
Illustrations	229.03		
Agents' Commissions	1,312.91		
Grant to Editorial Board	750.00		
		$18,228.54	
To *Other Expenses:*			
Bad Debts written off	$ 35.50		
Bond Interest	685.54		
Discount, Exchange and Interest	214.20		
General Sundries	1,602.36		
Associate Sec'y	429.29		
Postage	387.62		
Salaries	4,923.00		
Stationery and Printing	555.15		
Telephones and Telegrams	123.99		
		$8,956.65	
			$27,185.19
Excess of Revenue for period carried to *Deficit Account* as per Balance Sheet			$6,736.24

The Causes and Prevention of Otologic Conditions Following Swimming and Diving.—Problems incident to swimming and diving, H. Marshall Taylor, Jacksonville, Fla. states, demand the attention of the otorhinologists and public health officials. There should be a hearty co-operation of one group with the other. Prolonged chilling of the body surfaces causes a reduction of temperature and lowers the general and local resistance. The protective mechanism of the nose and its appurtenances against infection is definitely impaired by the destructive action of water.—*Jour. A. M. A.*, Aug. 4, 1923.

Lobar Pneumonia Complicating Induced Pneumothorax.—To two cases of lobar pneumonia involving the uncollapsed lung in the course of a therapeutic pneumothorax, and five cases of broncho-pneumonia, Clough Turrill Burnett, Denver, adds one case. A point of interest is the effect of this intercurrent infection on the bronchiectasis. Prior to the pneumonia, the patient was free from foul sputum as long as the lung was maintained in complete collapse; but if it was allowed to re-expand even slightly, the odor was again apparent. This disappeared again with complete collapse. While the treatment was of necessity discontinued for a time, the long interval being forty-seven days during the pneumonia as compared to an average of two weeks before, it was found that, following the pneumonia, white sputum appeared in increasing amounts immediately following the pneumothorax operations, the foul odor has at no time been noted. The patient has entirely recovered from the recent infection, and is continuing the pneumothorax in the hope of obtaining at least a partial relief from the bronchiectasis.—*Jour. A. M. A.*, July 21, 1923.

Introduction of Coccidioidal Granuloma into Chicago.—The report made by Edwin F. Hirsch, Chicago, besides placing on record another instance of coccidioidal granuloma, concers the possible permanent introduction of the disease into parts of the country which now are not infested. Judging from reports of this infection in Missouri, Kansas and South Carolina, the disease is either more widespread than has been thought, or it is slowly being carried into places which formerly were free. There may be some peculiar intermediate host or carrier in the natural transmission of the disease which makes human infection relatively infrequent and possible only in the natural habitat of such a carrier or host.—*Jour. A. M. A.*, Aug. 4, 1923.

XUM

Abstracts from Current Literature

MEDICINE

Digitalis Therapy Brooks, H., and Donaldson, B., (American Society of Physicians, 1923). *J.A.M.A.* Society Proceedings, June 30th, 1923.

After administration of standardized doses (1 c.c., or 1 cat unit), patients were tested under constant conditions and were observed as to symptoms of toxaemia—vertigo, confusion, nausea and vomiting, and also as to heart rate. An average dose of 1.13 cat units per kilogramme of body weight has been recorded by Eggleston, but we found wide variation of tolerance as estimated by dosage in relation to body weight. In abnormal hearts we found that the blood pressure was decreased and the ventricular rate markedly reduced in auricular fibrillation. In cases of hypertension with moderate nitrogen retention, the rate was decreased on an average eleven points; in more severe cases, four points. In normal hearts, pushing digitalis to the point of nausea had no effect on the heart rate. The first sign of digitalis toxaemia is nausea. The effect of the drug is on the smooth musculature, and atropin does not relieve the symptoms. Our average dosage was 0.26 c.c. per pound of body weight.

In the discussion which followed the reading of this paper, Dr. H. A. Hare, of Philadelphia, said: "I want to protest against carrying the dosage of this drug up to or near the toxic point. I think that the promulgation of this idea will lead to a great deal of error, if it is generally accepted. Many necropsy studies have indicated that there has been excessive digitalis dosage. I think that it will be unsafe in the future to follow the lines of this very sweeping conclusion. In cases of ruptured compensation we may need one or two maximal doses up to the point of nausea and vomiting, but there are hundreds of cases of failing heart in which much smaller doses can be given with excellent result. One difficulty may present itself, and that is that sufficient distinction has not been made between severe ruptured compensation, in which compensation is suddenly broken down and the condition of the patient is grave, and that form of gradual rupture of compensation in which more moderate symptoms are recognized as a manifestation of the condition. In the first case, doses that are approximately toxic can be given. That is practiced by many English physicians. They give large doses until the effect is produced, and then the dose is cut down. In the second type, it is not necessary to give large toxic doses in order to give the heart a rest. Another factor must be borne in mind: Many physicians fail to recognize that digitalis is a distinctly dangerous drug in some abnormal conditions of the circulatory system. When there is partial heart block, the giving of massive doses may complete the heart block. I have seen such a patient moribund from the administration of very massive doses. It has been my practice to give from fifteen to twenty minims of a good tincture to rest the heart over a long period of time. The whole theory of administration of digitalis is the rest and better nutrition of the heart muscle. We cannot rest the heart in twenty-four hours. We have to continue the effect of a massive dose by very many small doses. We put a man to bed to rest his body, and we must also use this idea in resting the heart over a long period of time. Satisfactory results cannot be accomplished in any other way."

Dr. Horatio Wood, of Philadelphia, said: "There is too great a tendency to impress the profession at large with the idea that massive doses must be given in every case, and that each case is not to be handled as an individual entity."

Blood Pressures in Fifteen Thousand University Freshmen. Alvarez, W. C., assisted by Wulzen, R., and Mahoney, L. J. *Arch. Intern. Med.*, July, 1923.

These studies were carried out at the University of California upon 10,000 men and 8,934 women. In the women the average pressure was about 11 millimetres of mercury lower than in the men and were more uniform. For men about sixteen years of age the blood pressure was about 127 on the average and about 118 mm. at the age of thirty; on the other hand, in the women it was about 118 at the age of sixteen years, 111 at twenty-four, and about 117 at forty. These figures reveal the strange fact that the average pressure both for men and women drops off gradually during the first years of adult life.

The author points out that hypertension is

common among the younger men, for about forty-five per cent. showed pressures over 130 and twenty-two per cent. gave pressures exceeding 140 millimetres of mercury. Hypertension was not nearly so common in the case of the women; twelve per cent. showing blood pressures above 130 and about two per cent. above 140.

Alvarez concludes that hypertension cannot always be put down to the account of infections or to a strenuous life, apparently it is a peculiarity that is inherited, which in women can be stayed off so long as the ovaries function well.

ARCHIBALD MALLOCH

Influence of Sodium Salicylate in the Arthritis of Rabbits Inoculated with Nonhaemolytic Streptococci. Swift, H. F., and Boots, R. H. *J. Exper. Med.*, April, 1923. Vol. 33, p. 553.

The use of salicylic acid or its derivatives in clinical medicine is not a novelty. These continue to be employed with satisfactory results in a variety of disorders, among which acute rheumatic fever is outstanding in respect to the improvement or relief of patients affected by it. One cannot ascribe such widely recognized results to the passing enthusiasm for some novelty in drug therapy. Substantiated by years of empiric observation, they must have some more worthy explanation. Obviously, the search for the latter is rendered much more difficult so long as the etiology of the disorder is not clearly established. If we adopt the current hypothesis that rheumatic fever is an infection—a sort of "attenuated pyaemia"—it seems logical to think first of all of the possible antiseptic action of salicylic acid in the body fluids, particularly in the inflamed joints where the infection may be localized. In previous issues of *The Journal* it has been pointed out, however, that the conditions existing in the living body preclude the possibility, or at any rate render it extremely improbable, that salicylic acid can accumulate in bactericidal quantities in the tissues during life. The antipyretic potency of the salicylates does not account for their beneficial effect in rheumatic arthritis, since other potent antipyretics are not equally efficient; and a similar argument of comparison applies to the doctrine of the analgesic virtues of salicylic acid derivatives. Morphine, for example, does not relieve the redness, heat and swelling of inflamed joints. In an attempt to imitate rheumatic arthritis experimentally in animals, Swift and Boots of the Hospital of the Rockefeller Institute, have noted that rabbits inoculated intravenously with nonhaemolytic streptococci, while under the influence of full therapeutic doses of sodium salicylate, developed almost as many inflamed joints as the untreated controls similarly inoculated. The salicylated rabbits, on the other hand, had a much higher proportion of mildly inflamed joints than did the controls. This anti-inflammatory action was most evident in the animals inoculated with streptococci of the lowest virulence, and could not be demonstrated in animals inoculated with haemolytic streptococci. Thus, we stand before the experimentally demonstrated fact that salicylates may modify favourably certain types of inflammation of the joints, while the explanation of this fortunately beneficent result still remains to be ascertained.—(*Jour. A.M.A.*).

Pneumonia. Wadsworth, A. (Symposium on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

The work done in New York State in the development of serum therapy in pneumonia was started in 1915, when centres for distribution of Type I antipneumococcus serum were established. This distribution is now more general. The serum has always been of the highest potency, according to the methods developed by Cole. The results from the civil population and from the army camps have been studied. The reduction in mortality is not convincing, although the statistics have been influenced by many factors, such as the difficulty of getting control cases, difficulty of getting standardized serum, and delay in treatment until an unfavourable prognosis could be expected. A study of the pneumonic process in man shows that the pneumococci develop in a partially immunized host, and that immunity is preserved by immune serum, although the pneumococci may survive for several days after immunization of the serum. Cases studied at the Rockefeller Institute were recorded under optimal conditions, and the mortality of 1.5 per cent. in 107 cases was very favourable. We have not been able to obtain such standardized serum, nor is serum labelled according to its potency, so that protective results are only approximate. The results reported from various localities and groups give contradictory results. In cases in which the serum is standardized and given early, the treated cases show greatly lessened mortality. In cases

in which there is delay in treatment and perhaps serum of low potency, the results are poor. There is no evidence that the serum is harmful unless the technique of administration is careless. The proper dose is from 50 to 100 c.c., four or five times. If Type I antiserum is given, promptly, carefully and regularly, it is of definite value in the treatment of Type I pneumonia.

Discussion.—Dr. Rufus I. Cole, New York: "Statistics in regard to antipneumococcus serum are very bewildering. There is difference in different hospitals, in different wards in the same hospital and difference from season to season. Personal observations seem to have more merit than statistical study. We have treated 241 cases of Type I pneumonia, with twenty-four deaths, a mortality of ten per cent., approximately. These were divided into cases in which serum might have been effective; and cases in which no serum treatment would have availed. I have never known of recovery to occur in pneumococcus meningitis, with or without serum. The other class of cases was due to too late, or poorly administered serum treatment. In this class, mortality might have been slightly reduced. In other cases, serum was given early and intensively, until the patient either died or recovered. The best guide to efficacy of the serum is the positive or negative blood culture. Pneumonia is a focal infection, likely to become generalized. Effective serum treatment eliminates bacteremia. If bacteremia persists, it is accompanied by endocarditis or meningitis, so that we do save lives even if not a considerable number. Serum treatment is more difficult for the private practitioner, on account of delay in early diagnosis, but with the aid of the state board of health I think the difficulties are not insurmountable."

Results of Administering Iodine to Patients Having Exophthalmic Goitre. Plummer, H. S., (American Society of Physicians, 1923). *J.A.M.A. Society Proceedings,* June 30th, 1923.

It has been taught that iodine should not be administered to patients with exophthalmic goitre, on the ground that it causes hyperfunction. There are two entities included in the term hyperthyroidism: first, exophthalmic goitre, second, hyperfunctioning adenomatous goitre. In the latter, the basal metabolism is more nearly normal. In exophthalmic goitre there are certain symptoms: (1) nervous phenomena, (2) eye symptoms. The first include purposeful but useless movements. The higher psychic processes are chaotic. The patients cannot explain why they cry or laugh. In the vegetative nervous sytem there is the same process of imbalance. These signs have given rise to such terms as "sympathotonic" or "vagotonic" goitre. These symptoms seem to be due to underlying metabolic disturbances. Often, after slight operations, the temperature rises and death occurs in a few hours. We judge the differential diagnosis by the nervous phenomena, which, if excessive, point to a great surgical risk. The eye phenomena are two: the exophthalmos, or protrusion of the eyeball, and the stare which fluctuates with the nervous phenomena. Anything that will overstimulate the thyroid can give the clinical picture of exophthalmic goitre. In such cases, the normal hormone, thyroxin, is not completely iodized. This incompletely built up thyroxin, as it leaves the gland, can enter into catabolic reaction faster than the normal, stable molecule and raise the metabolic rate more rapidly. If, therefore, we can change the character of the molecule, we can change the basal metabolism. If there is intense metabolic distress for lack of iodine, death occurs from lack of iodine. From this it follows that if we can change the production of abnormal substance to properly iodized substance we can cut down postoperative mortality, avoid crises, and change the picture of the nervous phenomena. Acting on this plan, we administered ten drops of compound solution of iodine for ten days following operation, with the result that we have found there is no such thing as postoperative deaths from hyperthyroidism if this dosage has been administered to the patient with regularity. In other words, the patient is relatively short of iodine, and dies from lack of it. When we replace the iodine, we do away with postoperative deaths.

Poliomyelitis—Epidemic Encephalitis—Bacillary Dysentery. Flexner, S., (Discussion on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings,* June 30th, 1923.

Poliomyelitis and encephalitis are two distinct diseases. They differ as much as measles and scarlet fever differ. Poliomyelitis is a disease which appears sporadically, and lately has appeared epidemically. It is more frequent in children. It is successfully transmitted to monkeys and the value of serum tested out. There is no such thing as artificially produced serum

against poliomyelitis, although we have a filtrable virus from the nervous system of patients. We cannot use this material, however, to immunize large animals, such as the horse, in order to get serum. On the other hand, in a recovered case, in monkey or man, there is for many months in the veins an antiserum which neutralizes the virus of poliomyelitis. Curative serum, therefore, exists. Monkey serum cannot be used for man. The animals are too small and too prone to other diseases to utilize their serum. Some measure of success has been attained in using serum of recovered humans in the treatment of other persons. During an epidemic people are, perhaps, more generous in this respect, and diagnoses are made more readily, but the method must be applied early because such widespread damage occurs to the nervous system that restoration is impossible. Fatality may be avoided, however, even if crippling cannot be prevented. Death follows involvement of the medulla with paralysis of the respiratory centres. The serum is given intraspinally, not intravenously.

Encephalitis is a disease which has appeared in a pandemic form during the past three or four years. There have been descriptions of the disease and of outbreaks before, but not in pandemic form. One explanation of this is that it is concomitant with influenza. There is some relationship to influenza. On the other hand, some workers think it is an independent disease but coincident chronologically. Hitherto the disease has not been so prominent as to make a great impression on the medical profession and laity, so that if you consider it as part of influenza, you must prove your thesis, whereas if you consider it as an independent disease, the approach to study is more effective. We cannot be sure that we have communicated it to animals, although we may have transmitted it to the rabbit. The monkey is not susceptible. The micro-organism which causes it is unknown. I think the solution of this disease is still in the future, for although every effort has been made, so far we have not been able to reach any definite conclusions, as we have with poliomyelitis.

Meningitides. Ayer, J. B., (Symposium on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

In the last ten years there has been no great advance in the treatment of meningitis in any form. For meningococcus meningitis we have no efficient serum; but, if we had, the end of a long channel seems a somewhat illogical approach from which to treat a general disease. There are various conceptions as to the origin and distribution of infection in meningitis. One is that the fluid originates in the choroid spaces of the lateral ventricles, and flows thence downward into the fourth ventricle and into the cisterna magna, upward over the convexities and over the arachnoid spaces. Meningitis is almost always a primary cerebral process; very rarely does the process start near the cord. Later there is a generalized cerebrospinal meningitis. As early as the second or third day there is blocking in the pathways by formation of exudate which obstructs any form of treatment given intraspinally. There may be blocking at one or two points. These facts demand that we seek some method of treating meningitis other than the lumbar route. In three days the canal is full of exudate and fibrin, and the infection has extended to the pia, the crus and the ventricles. There are also small abscesses from infection of the perivascular spaces. Ventriculitis also occurs in man as early as the fourth day. These conditions offer tremendous obstacles to treatment, and it is a wonder that serum ever reaches the brain at all. The fluid passes from the ventricles downward to the cisterna magna, from thence outward, upward and forward into a smaller cistern at the base of the chiasm and to the pons. In 1908, Cushing put a needle into the ventricle and introduced serum. The patient died, but lives were saved later by this procedure. I have lately used a method of puncture of the cisterna magna in 350 patients, without accident, at the Massachusetts General Hospital. My method offers three routes of choice, giving opportunity for irrigation. The ventricle can be approached by the cortex or by puncture of the corpus callosum. The method of approach hitherto has been miles away from the site of infection, and the pathways have early become blocked, making remedial measures impossible because they did not reach the trouble. These cases must be treated early and as near the process as possible. We have a choice of routes by which we can drain and introduce the serum, and we can irrigate efficiently by double or treble punctures, if necessary. If desired, we can reduce the volume of the ventricles by introducing a thirty per cent. hypertonic salt solution.

Discussion.—Dr. W. W. Herrick, New York:

"Our conception of meningitis infections has been too narrow. Clinical studies under the right conditions have shown that the disease is primarily a systemic infection with metastases into the meninges or elsewhere. Not only are the meninges involved but also the encephalon. Foci are present throughout the brain as a whole. In the treatment of meningococcus infections in general, if one can make a diagnosis early, I think intravenous treatment, supplemented by intraspinal treatment, is sufficient; but mechanical accidents in these cases are so common that the methods of meeting them are valuable. There are two phenomena: early blocking and late blocking. Early blocking is tragic, and due to inflammatory swelling of the encephalon, causing sudden death in the first twenty-four hours. Necropsy shows wedging of the brain substance down into the foramen magnum. I think the way to meet this situation is by injecting thirty per cent. hypertonic salt solution intravenously, or by injecting fifty per cent. saline sulphate of magnesium by rectum. There are two types. Most often there is involvement of the foramina of Luschka and of Magendie. I have seen one case in the aqueduct of Sylvius, and one case of cord blocking. There is one point of interest which is useful. Before undertaking ventricular puncture or cisterna magna puncture, the lumbar puncture needle can be placed in the foramen and manipulated vigorously (under anaesthesia), and if there is an accumulation blocking the foramina, the tissue that roofs over the floor of the fourth ventricle may be moved and cause breaking through of the tenuous subarachnoid adhesions. If this is unsuccessful, we can do a puncture of the cisterna magna, and lastly puncture of the ventricles. Cistern puncture is free from danger. In one case there was haemorrhage from the plexus of veins found in that region into the fourth ventricle. Whether that caused death, I do not know. Dr. Ayer's method is useful in handling the mechanical accidents that so frequently occur in this infection.

Research in Epilepsy. (Editorial, *J.A.M.A.*, June 30th, 1923).

In spite of extensive clinical and experimental study, epilepsy still remains an unsolved problem. Only within comparatively recent times has it been realized that it is a symptom-complex that may be elicited by many causes, and is not a disease *sui generis*. Even the site of the nervous discharge that is responsible for the convulsions has not been established, and the mechanism of the discharge has been variously ascribed to defective neuron construction, the action of toxins, vasomotor disturbances, and finally to purely psychogenic factors. In the April, May, and June issues of the *Archives of Neurology and Psychiatry* is a noteworthy series of articles reviewing previous work and reporting the results of clinical, ecologic and experimental investigations that show real progress in this baffling problem.

The resemblance between the tonic spasm of the early stage of an epileptic convulsion and the extensor rigidity of the decerebrate animal has been noted by various observers; the clonic spasms, on the other hand, have seemed to correspond with the effects of stimulating the cerebral cortex. Using injections of picrotoxin to excite convulsions, Pollock has demonstrated, in cats and dogs, that both tonic and clonic phases, indistinguishable from those in the intact animals, occur in animals that have been decerebrated by section of the brain stem below the optic thalami. Even after section below the level of the seventh nerve nuclei, similar fits are sometimes evoked, though they are less severe, and a larger dose of picrotoxin is required.

These observations, if confirmed, establish that the cerebral cortex is not necessary for the evocation of a typical fit. From clinical and experimental study, Rosett propounds a highly suggestive and fundamental conception of the epileptic seizure. He points out that typical tonic spasm, and even at times clonic twitchings, can be observed in the every-day reactions of normal people to sudden and unexpected shocks, and that these reactions are influenced, in a manner identical with that shown by the seizures of epilepsy, by the administration of bromides, phenobarbital and caffein. He also calls attention to the fact that the one constant feature of the epileptic seizure is loss of consciousness, a fact which suggests that ablation of cerebral function is essential. He concludes that the epileptic fit is a discharge of midbrain centres when released from the control of the cerebral cortex, and is not a cortical discharge. This concept of "normal epileptoid reactions" accords well with many otherwise inexplicable facts and agrees with Pollock's findings just described.

Elsberg and Stookey studied convulsions produced by injections of absinth. Among results

of their preliminary work, they find that, in cats and dogs, susceptibility to convulsions is increased by thyroidectomy and is not diminished by starvation. Even more striking is the conclusion that susceptibility is not exaggerated by diminishing the alkalinity of the blood by the direct injection of lactic acid. This observation appears directly to contradict widely accepted views on the *rôle* of acidosis in the mechanism of epilepsy. Acidosis is the cornerstone of the theory built up by Cuneo from his remarkable clinical and chemical studies. Cuneo's work, which is appreciatively reviewed by Osnato, leads him to conclude that, contrary to general belief, the acidosis which he conceives as liberating the toxic proteose is due to faulty digestion of starches from deficiency of the alkalization function of the intestinal mucosa and liver, with the consequence that salts of organic acids are set free in the circulation. He found that convulsions were more numerous and severe on a diet rich in starches than on a meat diet, and also that administration of sodium acetate or tartrate to epileptics resulted in such severe fits that the experiment had to be discontinued. These observations, as yet unconfirmed, open fresh leads which promise results for the future, of importance not only for the interpretation and eventual rational treatment of epilepsy, but also for the elucidation of some obscure phases of metabolism in uremia and other disorders accompanied by convulsions.

DERMATOLOGY

Resin Dermatitis. Report of a Case. Beinhauer, L. G., M.D., Pittsburgh. *J.A.M.A.*, July 7th, 1923.

The writer points out that occupational dermatoses are gaining increasing attention in direct proportion to the increase of Workmen's Compensation Acts, and the interest of employers in the causative factors of these diseases.

This is an interesting report of a violinist with recurring eruption of over five years duration. Especially during the last two years, the patient noticed a dry brittleness of the fingers and nails, with a fine, discrete, pin-head sized vesicular eruption extending from the web to the tip of the fingers. There was also a dry pruritic scaly eruption about the nose.

The violinist played in a theatre orchestra from September to April. The eruption disappeared in the summer. The fingers involved were the second and third on the left hand, prominent in violinists' technique. As a test, the resin was applied to the whole hand and dermatitis followed. Dermatitis factitia was ruled out and negative tests were made for proteins and ringworm.

Skin tests were positive to dark resin and negative to the white and red varieties. A cure was effected when white or red resin was applied to the bow and the dark resin eliminated.

C. R. BOURNE

Treatment of Ringworm. Whitfield, A. *The Lancet*, June 2nd, 1923.

This subject is dealt with under four headings:

(1) Ringworm of the hairy regions. Complete epilation is necessary as no treatment penetrates the hair completely. Methods mentioned are X-rays and croton oil treatment. Both have the risk of permanent baldness, but, in expert hands the danger of the former is lessened. The latter is painful and leads to pustulation. To protect the healthy hair Whitfield's "Guard ointment" is used: ac. benz. gr. xxv; ac. salicyl. gr. xv; lanolin, soft paraffin ad. oz. i. Isolation is necessary while the hairs are falling.

Another method is: Equal parts of sodium chloride and vaseline, rubbed in once daily, after bathing the head in hot water (painful but not so dangerous).

Whitfield's ointment for depilatory is usually efficacious, i.e., ac. benz. dr. i; acid. salicyl. dr. ss; lanolin dr. iv; soft paraffin ad. oz. i rubbed in thrice daily.

(2) Nails.—Under a general anaesthetic all diseased nail to be removed. Dress with ac. salicyl grs. xx. ung-chrysarobin ad. oz. i daily for four weeks.

(3) Glabrous skin of body and limbs offers little difficulty. Paint with equal parts of tr. iodi., and liq. iodi. fort.

(4) Dhobi Itch of hands and feet.—This form is obstinate owing to the thickness of the skin. Permanent cure usually results from the following treatment: After the morning bath trim all vesicles and horny flaps. Rub areas with swab and sol. chrysarobin, ten per cent. in equal parts acetone and methylated spirits. Use cheap cotton socks. Wash in evening and apply ointment of five per cent. benzoic and three per cent. salicylic acids. Continue for four weeks unless redness supervenes, in which case the ointment only is used.

C. R. BOURNE

XUM

News Items

GENERAL NEWS

WINDWARD ISLAND MEDICAL SERVICE

Word having been received from the British Medical Association that conditions under which medical officers are working in the Windward Island Service are very unsatisfactory, particular reference having been made to inadequate remuneration, physicians throughout Canada are advised to refuse acceptance of appointments in the Windward Islands until such time as the existing grievances are righted. Further particulars on this matter will be gladly supplied by the General Secretary of the Canadian Medical Association.

According to arrangements which are absolutely unique in the history of the Canadian Medical Association, Dr. F. J. Tees, of Montreal, lecturer in Clinical Surgery at McGill University, Dr. F. W. Marlow, Associate Professor of Gynaecology, University of Toronto, and Dr. T. C. Routley, the newly elected General Secretary of the Canadian Medical Association, met in Victoria, B.C., on July 3rd, to address the Victoria Medical Society. The group then proceeded to Vancouver, visiting the cities of the West in the following order: Vancouver, July 4th and 5th; Calgary, July 9th and 10th; Edmonton, July 11th; Saskatoon, July 12th; Regina, July 14th; Winnipeg, July 15th and 16th; and Port Arthur, July 17th. Dr. Tees spoke on "Fractures"; Dr. Marlow, "Symptomatology of Pelvic Diseases"; while Dr. Routley spoke on "The Aims and Objects of the C.M.A." In addition to this, Dr. Marlow took the opportunity in the various cities of discussing with the men the *pros* and *cons* of the formation of a Canadian College of Physicians and Surgeons. From the point of view of attendance at the meetings, enthusiasm, cordiality, harmony, and a most generally expressed desire in all parts of the West for the furtherance of all efforts which might be calculated to build up a strong national organization of the profession, it was very evident that the Association has a very important and useful part to play in the lives of the practitioners of medicine in Canada. A few points might just here be stressed: Each of the provinces visited has important provincial problems which the provincial Associations are endeavouring to work out to the best advantage in their own way. Some important questions, like a common factor, appear to be in all the provinces. At the present time, machinery is as yet undeveloped which keeps any one province thoroughly conversant and informed on the problems of their *confrères* in the other provinces. The Canadian Medical Association has a great work before it, particularly in the field of acting as a clearing house for the nine provincial units. If the Canadian Medical Association shows service, a large membership is guaranteed. While this is the first tour of the kind ever conducted by the Association, it is fully believed that the purpose in mind was very well served in that a personal contact was set up which should be productive of better relations in the future. The sincere thanks of the Canadian Medical Association are due to Drs. Tees and Marlow who not only gave their time to make this trip, but also defrayed their own expenses.

CHEMIST-PHARMACOLOGIST WANTED AT OTTAWA

The Secretary of the Civil Service Commission has asked if we would bring to the notice of the readers of the *Journal* that a chemist-pharmacologist is to be appointed for the Division of Medical Research in the Department of Health at Ottawa. The initial salary is $3,480 per annum which will be increased upon recommendation of efficient service at the rate of $180 per annum, until a maximum of $4,020 per annum has been reached. The candidates must be graduates in science or medicine from a university of recognized standing with specialization in pharmacological chemistry and at least two years' post-graduate study in pharmacological work or equivalent post-graduate teaching experience. He must be able to carry on independent research and must be able to read French and German fluently. He will be required to perform *biological* and chemical essays of pharmacopoeial and pharmaceutical preparations and of refined and crude drugs, etc. If in other ways eligible preference is given to those who have seen active service overseas or on the high seas.

For this particular competition (No. 5922) applications must be filed in the office not later than September 27th. Forms may be obtained from the offices of the Employment Service of Canada, from Postmasters at Prince Rupert, Vancouver, Victoria, Edmonton, Calgary, Regina, Winnipeg, Quebec, Charlottetown, Halifax, Fredericton and St. John, or from the Secretary of the Civil Service Commission.

The annual assembly of the Tri-State District Medical Association will be held at Des Moines, Iowa, from October 29 to November 1, inclusive. The Association is purely a post-graduate organization and meets for scientific study. All members in good standing of Canadian provincial associations are invited to attend and to take part in the programme. Many well known American physicians and surgeons are on the programme committee. The Association headquarters will be at the Fort Des Moines Hotel.

NOVA SCOTIA

A plan is on foot to erect a hospital at Inverness.

Dr. Fraser Harris, Professor of Physiology at Dalhousie, is summering in England.

Dr. H. R. Corbett, a recent graduate of Dalhousie, has been appointed to the Staff of the Nova Scotia Sanatorium.

The seventieth annual meeting of the Medical Society of Nova Scotia was held at Windsor on the third and fourth of July, under the presidency of Dr. Ross Millar, of Amherst, and was of exceptional interest. The attendance was unusually large, and, in addition to a full programme of addresses, papers and demonstrations, much business of importance was disposed of. The addresses in medicine and surgery, given by Dr. Gordon, of Montreal, and Dr. Cheever, of Boston, were greatly en-

joyed. Dr. J. W. S. McCullough, of Toronto, who was to have given the address in public health, was unfortunately unable to attend. The Society meets next year at Amherst. Dr. O. B. Keddy, of Windsor, is the new president.

The Association of Medical Health Officers of Nova Scotia met in annual session at Windsor the day preceding the meeting of the Medical Society. A good attendance and an excellent programme combined to make the meeting very successful. Dr. G. C. W. Bliss, of Amherst, was succeeded in the presidency by Dr. C. S. Marshall, of Bridgewater. Dr. A. C. Jost, Provincial Health Officer, was elected secretary. A feature of the meeting was a very able address by a veteran physician, Dr. J. B. Black, of Windsor, who, while a member of the Dominion House of Commons, made the initial move which ultimately resulted in the establishment of the Federal Department of Health.

Dr. B. Franklin Royer has resigned his position as executive officer of the Massachusetts-Halifax Health Commission, and has returned to his native state (Pennsylvania). Before leaving Halifax, he participated in a very interesting event, in which Miss Jessie Ross, the chief nurse of the Commission, became Mrs. Royer. Both Dr. and Mrs. Royer are well known to those who specialize in public health, and their unusual qualifications for directing public health activities, their intense interest in, and tireless devotion to, their work, and the readiness with which they responded to every request for assistance, gained for them many friends and admirers in Halifax and in fact throughout Nova Scotia. Dr. Royer plans to spend several months in travel before resuming work in the public health field. Dr. T. M. Silnilwicz, the tuberculosis examiner for the Commission, has been placed in charge of the executive work pending the appointment of a successor to Dr. Royer.

The bulletin of the Medical Societies of Nova Scotia, for July, 1923, gives the details of the medical societies of the province. Full reports of recent medical society meetings are given, including that of the Canadian Medical Association, and of the Medical Health Officers' Association, meeting in Windsor on July 3rd. The bulletin is in attractive form and contains in its pages much that should be of interest to the Nova Scotian profession.

QUEBEC

Dr. W. W. Chipman has left for a two months' trip to England and Scotland.

Dr. E. W. Archibald has gone to Europe and expects to return in September.

Dr. J. B. McConnell was the recipient of an illuminated address and a travelling handbag from a number of his *confrères* and some of his first patients, as a mark of esteem and to commemorate his fiftieth mile stone in the practice of medicine.

Dr. S. Grondin has been appointed to be official mentor in Paris of the many students from Quebec who are studying in the French capital. Dr. Grondin knows Paris well having studied there on different occasions. He will not only look after the welfare of these students, but will be in a position at the same time to assure them the most advantageous and profitable means of perfecting themselves in their studies.

Nearly one-third of the children attending schools bear latent tuberculosis in their bodies, declares Dr. Corsin, D.P.H., District Health Inspector, writing in the *Sanitary Bulletin*, published by the Provincial Health Department. These children need to be protected against the germs that "slumber in their lungs and glands." Further, the children are constantly exposed to contagion in school, from each other and also from the teacher. As other causes of tuberculosis in schools are cited, absence of disinfection in class rooms, etc., bad heating, dry sweeping, insufficient ventilation, unsatisfactory toilet accommodation, common use of drinking utensils, pencils, slates, etc. In addition to remedying these defects, Dr. Corsin recommends restraining the efforts of the over-ambitious scholar, whose struggles for a high place in his class frequently leave him physically weakened and an easy victim for disease. Work should be regulated in such a way as not to take the place of recreation, relaxation and physical exercise for the normal development of the body.

At a meeting of the Board of Governors of McGill University in July last, leave of absence for one year was granted to Dr. Maude E. Abbott, curator, and E. L. Judah, osteologist and preparator, of the McGill Medical Museum. Dr. Maude E. Abbott goes to the chair of pathology and bacteriology in the Women's Medical College of Pennsylvania, Philadelphia, where, as professor of these united subjects she will be given assistance and ample scope in the development of medical research and the co-relation of clinical and bacteriological teaching. Mr. Judah, who has filled the post of preparator in the McGill Museum for some twenty-seven years, and began work there as a pupil of the late M. Jules Baillie, a distinguished technician and a member of the French Academy, goes to the Mayo Clinic of Rochester, Minn., where he will be given every facility in the development and construction of a great museum. It is the intention of both Dr. Abbott and Mr. Judah to return to McGill after the year has elapsed, Mr. Judah to assist in the development of the museum of the new Pathological Institute, and Dr. Abbott to complete the scientific catalogues of both McGill Medical and the Canadian Army Medical Museum, of which she is managing editor.

The Community of the Sisters of Providence has bought the Lapierre farm at Cartierville as a site for a large hospital for incurables, and a sanitarium for tuberculous patients which will be erected. The tract of land, six acres in width by about twenty-three in length, offers every advantage desirable for the erection of the proposed fire-proof hospital. It will contain 800 beds, 400 for the tuberculous, and 400 for the incurable cases. The architects, Viau & Venne of Montreal, have charge of the construction. The members of the Board of Health and many physicians who make the treatment of tuberculosis a specialty, have been consulted and all unanimously approve of the site of the future hospital. The Community of the Sisters of Providence intend to instal every modern convenience, and make the institution thoroughly up-to-date in every respect.

Dr. W. G. Reilly was appointed president of the Province of Quebec Medical Association at the annual meeting held here; *Vice-presidents*, Dr. P. Z. Rheaume, Montreal; Dr. W. W. Chipman, Montreal, and Dr. Daignault Quebec; *Joint secretaries* Dr. J. U. Gariepy and Dr. D. Grant Campbell.

Dr. Louis-Francois Badeaux sailed from Quebec on the *S.S. Antonia* for France where he will spend a year in special studies in Paris. A district meeting of the medical societies of Arthabaska and Three Rivers is being

XUM

held at Victoriaville. Among the principal speakers Dr. Normand will address the meeting on "Abdominal Surgery" and Dr. Omer Desjardins city health officer will also read a paper.

Dr. Carlyle Porteous has recently been appointed superintendent of the Protestant Hospital for the Insane. Verdun, in succession to Dr. T. W. Burgess.

The merging of the Montreal Maternity Hospital with the Royal Victoria Hospital and the proposed erection in the grounds of the Royal Victoria Hospital of the new Royal Victoria Montreal Maternity Pavilion will greatly increase the hospital teaching facilities for McGill University. The Royal Victoria Montreal Maternity Pavilion and receiving stations under its ægis will be the centre of teaching in maternity work for medical students at McGill. There will probably be receiving stations in various parts of the city but it is too early yet for any definite plans to have been formulated. In constituting a great teaching centre for McGill University the Royal Victoria Montreal Maternity Pavilion will be continuing the work of the Montreal Maternity Hospital. The Montreal Maternity Hospital has always been a McGill institution as it were. The University, however, did not contribute anything towards its support and had nothing to do with its administration but the head of the department of obstetrics and gynaecology has always been the medical director of the hospital and the university nominated the medical staff, the board of management of the hospital confirming the appointments.

Montreal's unique record of absolute freedom from smallpox in over eighteen months is one in which Dr. S. Boucher, director of public health, is taking great pride. There has not been a single case reported to the authorities for nearly two years and the chairman of the board of health attributes this to the fact that vaccination is general, at least among school children. Present regulations bar any child from attending school who has not been vaccinated within the prescribed time and for the convenience of the public and to save additional expense for the parents the city has maintained for some time free vaccination stations at convenient parts of the city. Slight modifications have been made in the list issued last week on the location and opening time of these and a corrected schedule has been prepared.

Dr. C. F. Martin was appointed Dean of the Faculty of Medicine, McGill University, at a meeting of the Board of Governors of the University, succeeding Dr. George E. Armstrong, who held the office. The *Journal* extends its congratulations to Dr. Martin.

A series of free courses on the use of insulin in diabetes will be given by Dr. E. H. Mason, Director of the Metabolism Clinic in the Royal Victoria Hospital, under the auspices of the Rockefeller Fund. The first course will be held on August 27th and 28th in periods of four hours on each day. Subsequent courses will be given at fortnightly intervals, September 10th and 11th and September 24th and 25th. To ensure personal attention each class will be limited to twenty physicians. The course will include: (1) Description of the development of the discovery of insulin; (2) Its action in the body. Hypoglycaemia; (3) Details of insulin treatment; (4) Calculation and preparation of diets and food stuffs; (5) Methods of controlling insulin administration; (6) Special topics—surgical and other complications. If the number of physicians applying to take the courses cannot be dealt with on the dates given above, further periods of instruction at a later date are contemplated.

The appointment of Dr. Edward Archibald to be Professor of Surgery and Chairman of the Surgical department in the Faculty of Medicine of McGill University has been received in the University and by the teaching staff of the Medical Faculty with enthusiastic approval. The appointment will be equally popular throughout the medical world, and especially so in Canada and the United States where he is widely known for his interest in and his contributions to the scientific aspects of surgery, and for his application of the knowledge gained in the experimental laboratory to the practice of surgery.

His experimental and clinical publications on pancreatitis are quoted wherever this subject is discussed. His contributions to neurological surgery in civil and military practice are numerous. His more recent papers and addresses on the treatment by surgery of certain types of pulmonary tuberculosis have caused widespread interest, and his teaching on this difficult subject is being rapidly accepted and followed.

Dr. Archibald is a graduate of McGill in Arts and Medicine. He was a resident surgeon in the Royal Victoria Hospital under Dr. James Bell. After a period of study in France and Germany he returned to the Hospital as surgeon, in charge of a service. This position he has filled since 1904. He is a member of the Interurban Surgical Society of America, of the Clinical Surgeons of America, of the Neurological Society, of the Association of Thoracic Surgeons, of the Tuberculosis Society, and is on the Board of Governors of the American College of Surgeons.

ONTARIO

COUNTY SOCIETY MEETINGS

On July 11th, the Lambton County Medical Society met at Sarnia, and an address was given by Dr. F. A. Cleland, of Toronto, on "Diagnosis and treatment of acute abdominal pelvic conditions."

A meeting of the Hastings County Medical Society was held at Madoc, July 11th. The Society was addressed by Dr. G. S. Young, of Toronto, on "Psychotherapy from the standpoint of the general practitioner."

On July 18th, a union meeting of the Oxford and Perth Medical Societies was held at Lakeside, addresses being given by Dr. Norman Gwyn on "Postoperative pulmonary complications"; and by Dr. A. J. Grant, of London, on "Local anaesthesia, its uses and limitations."

The York County Medical Society met at Mount Albert, on July 18th. Dr. R. P. Smith, of Hamilton, discussed "Problems of infant feeding."

The Peel County Medical Society held a well attended meeting on July 19th, in Brampton. The following very interesting and instructive addresses were given: "Diagnosis and treatment of acute pelvic conditions," by Dr. F. A. Cleland"; "The uses of radium in general practice," by Dr. Arnold Clarkson; "The relationship between the medical officer of health and the general practitioner," by Dr. D. A. McClenahan.

July 26th.—Dr. Charles Macklin, London; Subject: "Recent studies on the structure of the lung." Dr. Anderson, Director of Laboratories; Subject: "The value of a public health laboratory to the general practitioner." August 2nd.—Dr. W. L. Robinson, Toronto; Subject: "Classification, pathology, diagnosis and treatment of diseases of the thyroid." Dr. R. D. Rudolph, Toronto; Subject: "The uses of cardiac stimulants in the care of the sick." Dr. George Ewart Wilson, Toronto; Subject: "Intestinal obstruction."

August 9th.—Dr. G. S. Young, Toronto; Subject: "A discussion of the value of physical signs in the examination of a patient." Dr. C. S. Wright, Toronto; Subject: "Back

pain, with special reference to sacro-lumbar and sacro-iliac and their relation to compensation," with illustrations with lantern slides. Dr. N. A. Powell, Toronto; Subject: "Collies fractures."

On July 25th, Dr. G. McLarty, of Toronto, addressed the Huron County Medical Society, at Bayfield, on "Diagnosis and treatment of the psycho-neurosis."

Dr. H. B. Anderson addressed the Ontario County Medical Society, on August 2nd, on "Pituitary disease," the meeting being held in Victoria Park, Beaverton,

On August 3rd, the Victoria County Medical Society met in Bobcaygeon, addresses being given by Dr. H. S. Hutchison on, "The modern treatment of nephritis," and by Dr. H. B. Anderson on, "Pituitary disease." After the meeting, the visiting doctors and their wives were taken for a cruise around Pidgeon Lake.

Dr. T. C. Routley and Dr. J. W. Marlow were present at the meeting of the Victoria Medical Society, at Victoria, B.C. on July 3rd, commencing there a comprehensive trip through the Canadian West, a trip taken largely to bring them in touch with the medical profession and medical societies of the western provinces. Dr. F. J. Tees, of McGill University, represented the Province of Quebec on the trip at the luncheon at the Empress Hotel. Dr. Routley spoke on the question of post-graduate education. Dr. Marlow addressed the meeting on, "The symptomatology of pelvic diseases," and Dr. Tees lectured on, "Fractures."

FREE DISTRIBUTION OF INSULIN

The Minister of Health and Labour, the Hon. Forbes Godfrey, has authorized the following plan for the free distribution of insulin, which is now being manufactured on an adequate scale by the Connaught Laboratories of the University of Toronto.

Insulin will be distributed free, on and after September 1st, to all patients certified by their physician as being unable to pay for the remedy. The physician will order insulin as required from one of the eight laboratories of the Provincial Board of Health, located at—Fort William, Sault Ste. Marie, North Bay, Owen Sound, London, Toronto, Peterborough, Kingston, and Ottawa. These laboratories will be in a position to undertake, for local physicians, any necessary laboratory work in connection with the control of the administration of insulin. There are now about 600 physicians, who have taken a short course of instruction on insulin treatment, given by the University and the Toronto General Hospital, and, in case of emergency, any physician who is not entirely familiar with the details of the treatment, may secure the assistance of an officer of the Provincial Board of Health, who will be prepared to undertake the necessary laboratory work for those patients who are unable to pay for Insulin.

By direction of the Minister, the Provincial Board of Health, is preparing a circular, which will be given to physicians, outlining in detail, the plan of free distribution.

MANITOBA

THE MANITOBA SANATORIUM

A reading of the annual report for 1922 of the Manitoba Sanatorium, Ninette, well repays those who are interested in the treatment of tuberculosis. The Medical Superintendent, Dr. David A. Stewart, may point with pride to the work which has been accomplished since the Sanatorium was opened in 1909.

Special attention has been paid during the past year to the better diagnosis and treatment of tuberculosis of the intestinal tract. Some wealthy citizen of Manitoba could not do better than to donate another Alpine Lamp for use in the treatment of intestinal tuberculosis. Thirty to forty patients at a time are undergoing treatment by artificial pneumothorax. As is so often the case the need for more infirmary beds is felt and the Superintendent writes: "We have come to believe that staying in bed *after* symptoms have been subsided is one of the very best measures."

Before the disease can be prevented the world must be educated. Education has been an important part of the work at the Manitoba Sanatorium for "thirty-three medical students and young doctors, apart from the regular staff, served an apprenticeship during the year." Seventeen public addresses were also given, six talks to patients, nine lectures to graduate and under-graduate nurses, fourteen addresses and five papers to gatherings of doctors and students, and five other papers or pamphlets were written."

Manitoba is better off than some of the other provinces in Canada but let us quote the summary of its position with regard to tuberculosis; "at present in Manitoba the general knowledge of tuberculosis, its symptoms, its menace, its treatment, is such that out of ten who apply for treatment only three are at early or even moderately advanced stages, seven have far advanced disease, and of these seven, two are utterly hopeless."

Obituary

Dr. Latimer Pickering died at his home on August the 5th.

Dr. A. D. Elliott of Lucknow, Ontario, died suddenly at Kincardine, on August the 2nd.

Dr. A. B. Riddell a graduate of the Toronto Medical School, died in Richmond, on July 30th, aged sixty-two years.

Dr. Gordon Bell, provincial bacteriologist and professor of pathology of the Manitoba University Medical School, died in Windsor, on August the 8th. Born at Pembroke, in 1863, he was educated at the collegiate institute there, and later studied medicine at the University of Toronto Medical School, and the Manitoba Medical College.

Dr. George William Major, aged seventy-two years, native of Montreal and formerly throat specialist attached to the Montreal General Hospital, died in London, England, where he had lived for thirty years in retirement, following his departure from Canada rendered necessary by the precarious condition of his health. Dr. Major was a graduate of McGill University and was the first

XUM

throat specialist in Montreal. He was on the staff of the General Hospital here for many years, following study under the late Sir Morrell Mackenzie the noted London throat physician. Surviving Dr. Major are his wife and daughter in England, and two sisters in Montreal.

Dr. Albert Michell died in Toronto, on July 31st. Graduating at the University of Toronto in 1890, Dr. Michell began practice in Perth County, moving to Toronto six years ago.

It is with regret that we have to give notice of the death of the late **Dr. Fred W. Jardine** of Kensington, P.E.I. who died at the age of forty-five years. He was born September 21st, 1877. Dr. Jardine was attending to his large practice on the day of his death. He sat down to his evening meal and before he had finished, he fell off his chair and expired. Dr. Jardine was educated at Prince of Wales' College in Charlottetown. For some years he taught school. He then attended Dalhousie University, from which school he graduated with distinction, after which he started to practice at Kensington. He was a man of great energy, devoted to his profession and loved by his patients. He had been Mayor of Kensington on two different occasions. He leaves a widow, four sons and one daughter. His eldest son graduates from McGill this spring. He was a brother of Dr. John Jardine, of Scott, Sask.

Dr. S. P. Ford died in Norwood, Ont. on July 22nd, in his eighty-fifth year. A graduate of Buffalo, in 1864, and the University of Toronto Medical School, in 1869. He settled in Norwood, in 1874, and practiced there for forty-nine years. In his earlier life, Dr. Ford was assistant surgeon in the Federal army during the American Civil War. He took an active interest in educational matters and had been medical health officer of Norwood for several years.

Book Reviews

Nursery Guide for Mothers and Nurses By Louis W. Sauer, M.A., M.D. 188 pages, illustrated. Price, $1.75. Published by C. V. Mosby Company, St. Louis, U.S.A., 1923.

This little book covers the usual ground of the care of infants and children, is well written, and contains valuable information. In a book of this kind, however, it is questionable whether it is wise to incorporate so much regarding the diagnosis and treatment of the various conditions of childhood. Remarks of this kind frequently tend to unnecessarily alarm mothers and in many other instances parents may be tempted to treat and diagnose these ailments without the guidance of their physician, with sometimes disastrous results. The book would be more acceptable if matter of this kind were omitted. A B.

Books Received

Institutional Household Administration By Lydia Southard, B.A. 214 pages, with 91 illustrations. Price, $2.00. Published by J. B. Lippincott Company, 201 Unity Building, Montreal, 1923.

A text book of Therapeutics, Including the essentials of Pharmacology and materia medica. By A. A. Stevens, A.M., M.D. Sixth Edition, entirely reset. Octavo of 793 pages Price, $6.25. Published by W. B. Saunders Company, Philadelphia, 1923.

Les problems Actuels de Diététique. By P. Carnot and Marcel Labbé. 184 pages. Price, 8 frs. Published by J. B. Bailliere & Sons, 19 Rue Hautefeuille, Paris, 1923.

Les Colites. By Paul Carnot, Paul Harvier and R. Friedel. 224 pages, with 34 illustrations. Price, 10 frs. Published by J. B. Bailliere & Sons, 19 Rue Hautefeuille, Paris, 1923.

The Common Neuroses—their treatment and psychotherapy. By T. A. Ross, M.D., F.R.C.P.E. 256 pages. Price, 12.6, net. Published by Edward Arnold & Co., London, 1923.

The Hygiene of Marriage By Isabel E. Hutton, M.D. 112 pages. Published by William Heinemann (Medical Books) Ltd., London, 1923.

The Therapeutic Use of Digitalis By G. Canby Robinson, M.D. 137 pages. Price, $2.50. Published by Williams & Wilkins Company, Baltimore, 1923.

Surgical "Don'ts and Do's". By C. Hamilton Whiteford, M.R.C.S., L.R.C.P. A series of ten articles. 46 pages. Price, 3s. net. Published by Harrison & Sons, Ltd., London.

Clinical examination of the Nervous system By G. H. Monrad-Krohn, M.D., M.R.C.P. Second edition. 148 pages, with 33 illustrations and 4 plates. Price, 6s. net. Published by H. K. Lewis & Co. Ltd., 28 Gower Place, London, 1923.

Tubercle Bacillus Infection and Tuberculosis in Man and Animals. Second edition. By Professor Albert Calmette. 689 pages, illustrated. Price, $8.00. Published by Williams & Wilkins Company, Baltimore, Md., 1923.

Recovery Record for use in Tuberculosis By Gerald B. Webb, M.D., and Charles T. Ryder, M.D. 195 pages, 108 charts. Price, $2.00. Published by Paul B. Hoeber, New York, 1923.

The Infant and Young Child—Its care and feeding from birth until school age; a manual for mothers. By John Lovett Morse, M.D., Edwin T. Wyman, M.D., and Louis Webb Hill, M.D. 271 pages, illustrated. Price, $1.75. Published by W. B. Saunders Company, Philadelphia, 1923.

Bactericlogy—A study of microorganisms and their relation to human welfare. By H. W. Conn, Ph.D., and Harold J. Conn, Ph.D. 441 pages, illustrated. Price, $4.00. Published by Williams & Wilkins Company, Baltimore, 1923.

Digestive Disturbances in Infants and Children. By Charles Gilmore Kerley, M.D., and Leon Theodore LeWald, M.D., with a note on the surgery of infants by William A. Downes, M.D. 117 roentgen ray studies on 54 full page plates, and 49 text illustrations. Price, $12.00. Published by Paul B. Hoeber New York City, 1923.

XUM